

TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

Attorney's Docket Number

05725.0577

U.S. Application No.

International Application. No.

International Filing Date

Priority Date Claimed

PCT/FR99/01865

July 28, 1999

August 19, 1998

412 Rec'd PCT/PTO 19 APR 2000

Title of Invention:

DYEING COMPOSITION FOR KERATINOUS FIBRES WITH DIRECT CATIONIC COLOURING AGENT AND A QUATERNARY AMMONIUM SALT

Applicant(s) For DO/EO/US:

Christine RONDEAU

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. [] This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. [] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. [] is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. [X] has been transmitted by the International Bureau.
 - c. [] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [X] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. [] are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. [] have been transmitted by the International Bureau.
 - c. [] have not been made; however, the time limit for making such amendments has NOT expired.
 - d. [X] have not been made and will not be made.
8. [] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.
[] A SECOND or SUBSEQUENT preliminary amendment.
14. [] A substitute specification.
15. [] A change of power of attorney and/or address letter.
16. [] Other items or information:
 - a. [] Verified Small Entity Statement.
 - b. [] Copy of Notification of Missing Requirements.

09/529835

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17. [X] The following fees are submitted:

CALCULATIONS

Basic National Fee (37 CFR 1.492(a)(1)-(5)):

Search Report has been prepared by the EPO or JPO.....\$840.00
 International preliminary examination fee paid to
 USPTO (37 CFR 1.482).....\$670.00
 No international preliminary examination fee paid to
 USPTO (37 CFR 1.482) but international search fee
 paid to USPTO (37 CFR 1.445(a)(2)).....\$690.00
 Neither international preliminary examination fee
 (37 CFR 1.482) nor international search fee
 (37 CFR 1.445(a)(2)) paid to USPTO.....\$970.00
 International preliminary examination fee paid to USPTO
 (37 CFR 1.482) and all claims satisfied provisions
 of PCT Article 33(1)-(4).....\$ 96.00

ENTER APPROPRIATE BASIC FEE AMOUNT = \$ 840.00

Surcharge of \$130.00 for furnishing the oath or declaration later than
 [] 20 [] 30 months from the earliest claimed priority date
 (37 CFR 1.492(e)).

Claims	Number Filed	Number Extra	Rate	
Total Claims	53 -20=	33	X \$18.00	\$ 594.00
Independent Claims	9 - 3=	6	X \$78.00	\$ 468.00
Multiple dependent claim(s) (if applicable)			+\$260.00	\$

TOTAL OF ABOVE CALCULATIONS = \$1,902.00

Reduction by 1/2 for filing by small entity, if applicable. Verified
 Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28)

SUBTOTAL = \$1,902.00

Processing fee of \$130.00 for furnishing the English translation later
 than [] 20 [] 30 months from the earliest claimed priority date
 (37 CFR 1.492(f)).

TOTAL NATIONAL FEE = \$1,902.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The
 assignment must be accompanied by an appropriate cover sheet
 (37 CFR 3.28, 3.31).

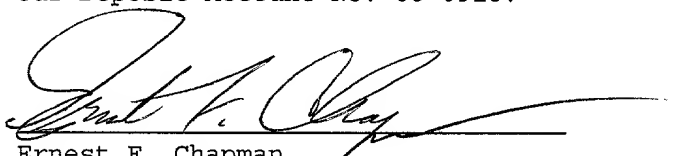
\$40.00 per property + \$
 TOTAL FEES ENCLOSED = \$1,902.00

Amount to be
 refunded \$
 charged \$

- a. [X] A check in the amount of \$1,902.00 to cover the above fees is enclosed.
 b. [] Please charge my Deposit Account No. _____ in the amount of
 \$ _____ to cover the above fees. A duplicate copy of this sheet is
 enclosed.
 c. [X] The Commissioner is hereby authorized to charge any additional fees
 which may be required, or credit any overpayment to Deposit Account
 No. 06-0916. A duplicate copy of this sheet is enclosed.

The Commissioner is hereby authorized to charge any other fees due under 37 C.F.R. §1.16
 or §1.17 during the pendency of this application to our Deposit Account No. 06-0916.

SEND ALL CORRESPONDENCE TO:
 Finnegan, Henderson, Farabow
 Garrett & Dunner, L.L.P.
 1300 I Street, N.W.
 Washington, D.C. 20005-3315
 EFC/FPD/rgm


 Ernest F. Chapman
 Reg. No. 25,961

Submitted: April 19, 2000

09/529835
422 Rec'd PCT/PTO 19 APR 2000

PATENT
Attorney Docket No. 05725.0577-00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:)	
)	
Christine RONDEAU)	
)	
Serial No.: Unassigned)	
)	Group Art Unit: Unassigned
U.S. National Stage Application of:)	
PCT/FR99/01865)	Examiner: Unassigned
)	
PCT Filed: July 28, 1999)	
)	
Priority Filed: August 19, 1998)	
)	
National Stage Entry: April 19, 2000)	
)	
For: DYEING COMPOSITION FOR)	
KERATINOUS FIBRES WITH DIRECT)	
CATIONIC COLOURING AGENT AND)	
A QUATERNARY AMMONIUM SALT)	

BOX PCT
Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to the examination of the above application, please amend this application
as follows:

IN THE SPECIFICATION:

On page 3, line 11, delete "particular anionic surfactant" and replace with
--quaternary ammonium salt--.

LAW OFFICES

FINNEGAN, HENDERSON,
FARABOW, GARRETT
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, D. C. 20005
202-408-4000

On page 48, line 14, delete "oleocetylhydroxyethylammonium" and replace with --oleocetyltrimethylhydroxyethylammonium--.

On page 49, line 9, in formula (VII), change " $_2 X$ " to -- $2 X$ --.

IN THE CLAIMS:

Please cancel claims 1 and 9-31 without prejudice or disclaimer, amend claims 2-8, and add new claims 32-77 as follows:

In claim 2, lines 1-2, delete "Composition according to claim 1, characterized in that" and replace with --A composition according to claim 32, wherein--.

on page 80, line 2, after "(I51);" delete "and";

on page 80, line 4, after "(I53);" insert --and--;

on page 80, line 6, delete ";" and insert a period after "(I54)".

3. (Amended) A composition [Composition] according to Claim 2, [characterized in that] wherein the cationic direct dyes are chosen from the compounds having [correspond to the] structures (I1), (I2), (I14), and (I31).

In claim 4, lines 1-2, delete "Composition according to claim 1, characterized in that" and replace with --A composition according to claim 32, wherein--.

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& DUNNER, L.L.P.
1300 I STREET, N. W.
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In claim 5, lines 1-2, delete "Composition according to claim 1, characterized in that" and replace with --A composition according to claim 32, wherein--.

6. (Amended) A composition [Composition] according to Claim 5, [characterized in that] wherein the cationic direct dyes of formula (III) are chosen from the compounds [corresponding to the] having structures (III4), (III5) and (III13).

In claim 7, lines 1-2, delete "Composition according to claim 1, characterized in that" and replace with --A composition according to claim 32, wherein--.

In claim 8, lines 1-2, delete "Composition according to claim 1, characterized in that" and replace with --A composition according to claim 32, wherein--.

on page 104, line 1, after "(IV)₇₆", insert --; and--.

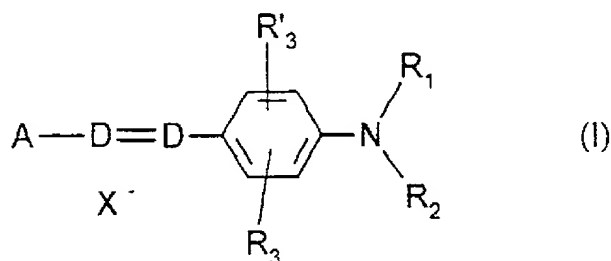
on page 104, line 2, insert a period after "(IV)₇₇".

Please add new claims 32 to 77 as follows:

--32. A composition for dyeing keratinous fibers comprising, in a medium suitable for dyeing,

(i) at least one cationic direct dye chosen from:

a) cationic direct dyes of formula (I):



in which:

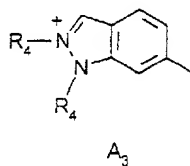
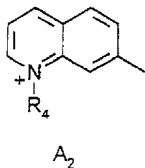
D is a nitrogen atom or a -CH group,

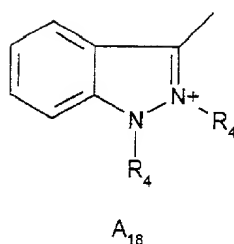
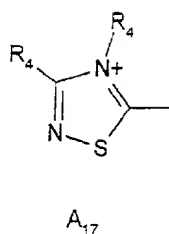
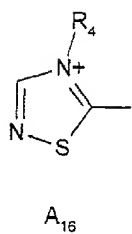
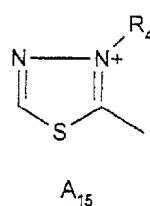
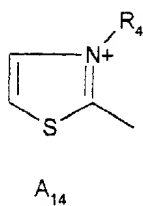
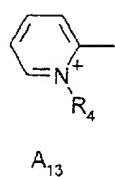
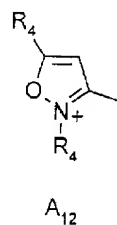
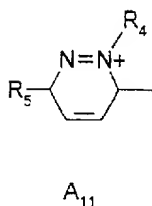
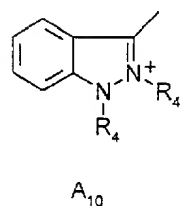
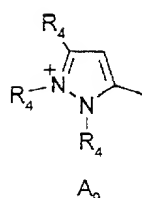
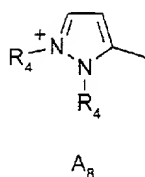
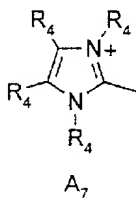
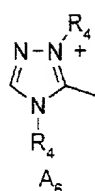
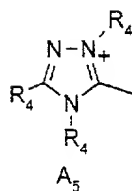
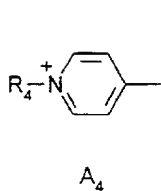
R₁ and R₂, which are identical or different, are chosen from a hydrogen atom; a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂ radical or form with each other or a carbon atom of the benzene ring a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with at least one C₁-C₄ alkyl radical; and a 4'-aminophenyl radical,

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FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
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X^- is an anion,

R4N1=C(R4)C=C(R4)N1R4
A₁

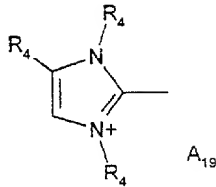


THIS DOCUMENT CONTAINS NEITHER RECOMMENDATIONS NOR
CONCLUSIONS OF THE NATIONAL BUREAU OF STANDARDS
AND IS NOT TO BE USED IN CONNECTION WITH ANY
LEGAL PROCEEDING OR IN CONNECTION WITH ANY
CLAIM IN A PATENT

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FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
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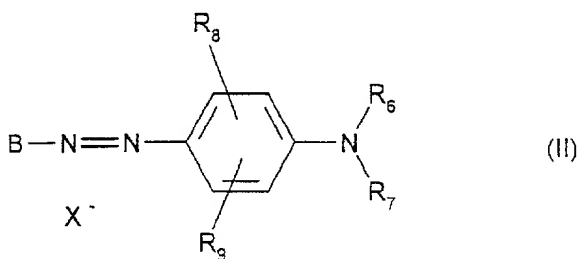
and



in which R₄ is a C₁-C₄ alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R₅ is a C₁-C₄ alkoxy radical,

with the proviso that when D represents -CH, A is A₄ or A₁₃ and R₃ is different from an alkoxy radical, then R₁ and R₂ are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



in which:

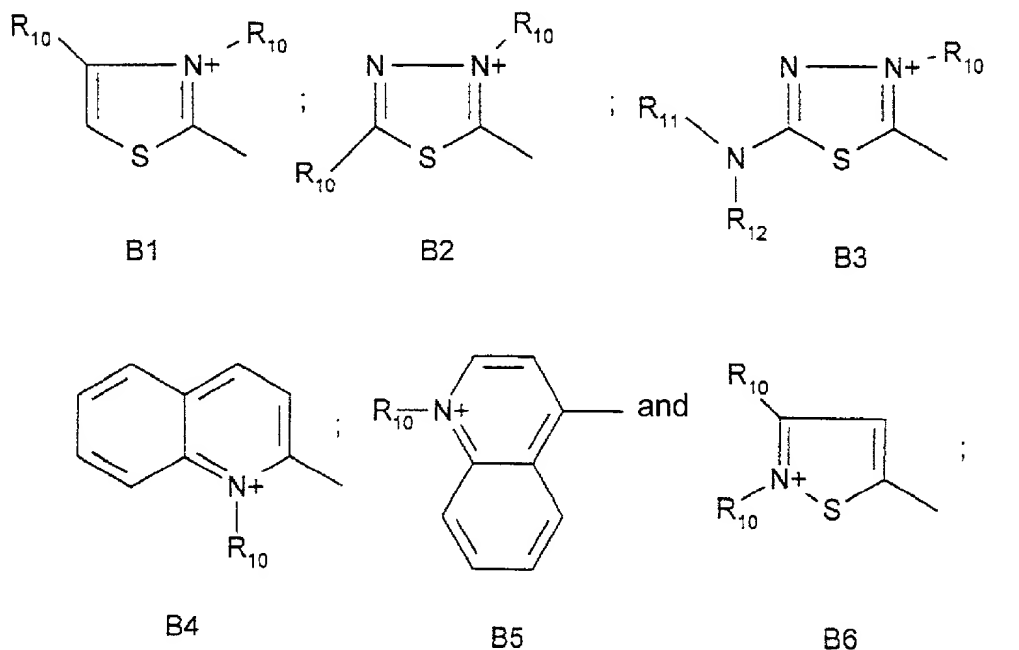
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

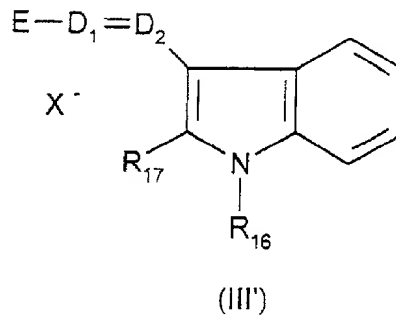
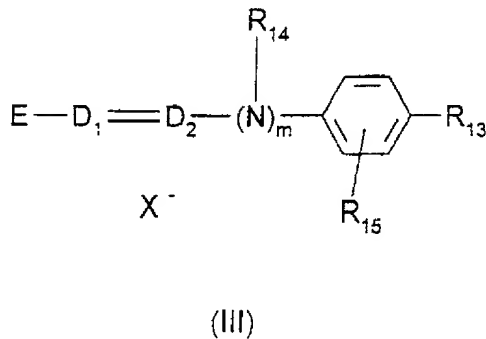
X^- is an anion,

B represents a group chosen from the following structures B1 to B6:



in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

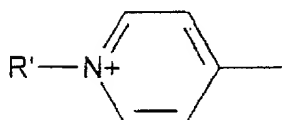
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

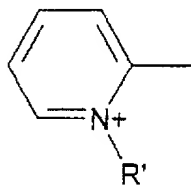
with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

X^- is an anion,

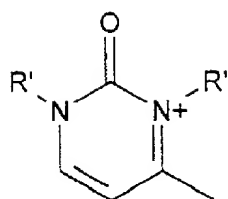
E is a group chosen from the following structures E1 to E8:



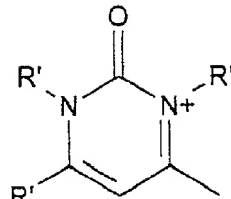
E1



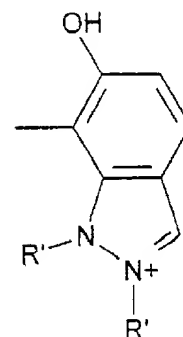
E2



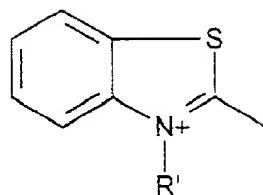
E3



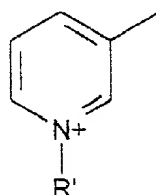
E4



E5

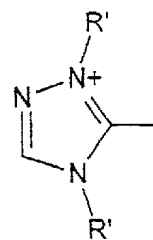


E6



E7

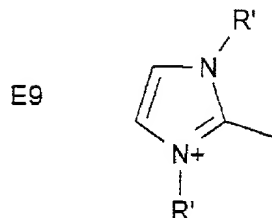
and



E8

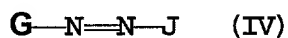
in which R' is a C₁-C₄ alkyl radical;

when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



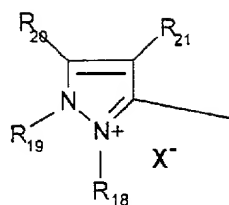
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

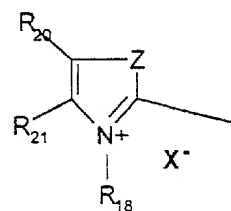


in which:

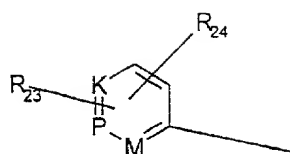
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

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FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
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R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$, where r is zero or 1;

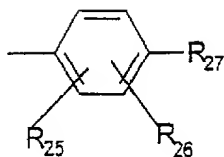
R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :



in which structure J_1 ,

R_{25} is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a radical chosen from -OH, - NO_2 , - NHR_{28} , - $NR_{29}R_{30}$, and - $NHCO(C_1$ - C_4 alkyl), or forms with R_{26} a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R_{26} is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; and a C_1 - C_4 alkoxy radical, or forms with R_{27} or R_{28} a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R_{27} is chosen from a hydrogen atom, an -OH radical, an - NHR_{28} radical, and an - $NR_{29}R_{30}$ radical;

R_{28} is chosen from a hydrogen atom, a C_1 - C_4 alkyl radical, a C_1 - C_4 monohydroxyalkyl radical, a C_2 - C_4 polyhydroxyalkyl radical, and a phenyl radical;

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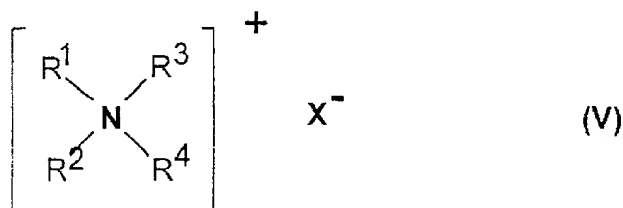
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C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

(ii) at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):



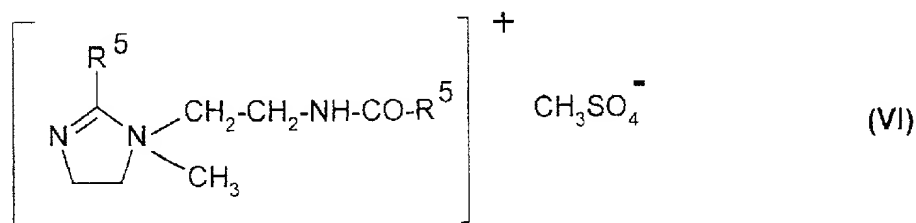
in which

the radicals R¹, R², R³, and R⁴, which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxycarbonylalkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl,

aromatic, aryl and alkylaryl radicals comprising 12 to 30 carbon atoms, wherein at least one radical among R^1 , R^2 , R^3 and R^4 is a radical comprising 8 to 30 carbon atoms;

X^- is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

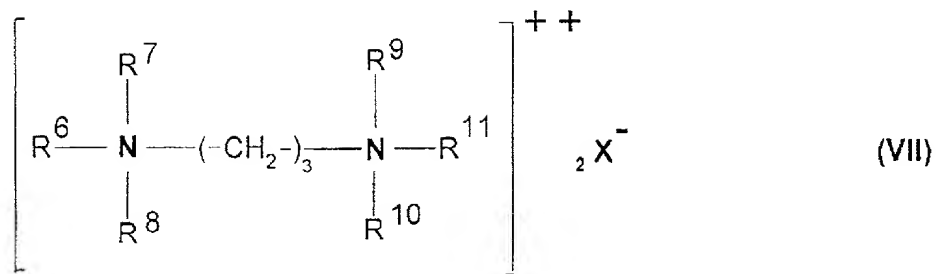
(ii)₂ - imidazolium salts of the following formula (VI):



in which

R^5 is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):



in which

R^6 is an aliphatic radical comprising 16 to 30 carbon atoms,

R^7 , R^8 , R^9 , R^{10} and R^{11} are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X^- is an anion chosen from halides, acetates, phosphates and sulphates.

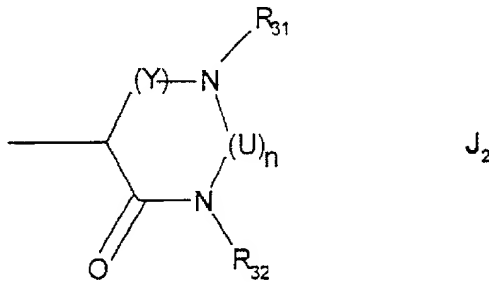
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33. A composition according to Claim 32, wherein in the definition of said at least one cationic direct dye of formulas (I), (II), (III), and (III'), X- is chosen from chloride, methylsulphate, and acetate.

34. A composition according to claim 32, wherein in the definition of said cationic direct dyes of formula (IV), in G₁ and G₂, X⁻ is chosen from chloride, iodide, methylsulphate, ethylsulphate, acetate and perchlorate.

35. A composition according to Claim 32, wherein in the definition of said cationic direct dyes of formula (IV), the 5- or 6- membered nitrogen containing heterocycle group of J is chosen from groups having the structure J₂ below:



in which structure J₂,

R₃₁ and R₃₂, which are identical or different, are chosen from a hydrogen atom, a C₁-C₄ alkyl radical, and a phenyl radical;

Y is a -CO- radical or the radical $\begin{array}{c} \text{CH}_3 \\ | \\ \text{---C=} \end{array}$; and

n = 0 or 1, wherein when n is 1, U is a -CO- radical.

36. A composition according to Claim 32, wherein said at least one cationic direct dye is present in an amount ranging from 0.001 to 10% by weight of the total weight of the composition.

37. A composition according to Claim 36, wherein said at least one cationic direct dye is present in an amount ranging from 0.005 to 5% by weight of the total weight of the composition.

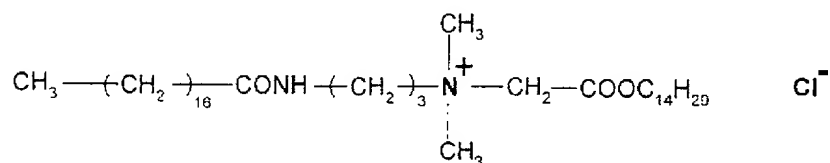
38. A composition according to Claim 32, wherein the quaternary ammonium salt of formula (V) is a dialkyldimethylammonium or alkyltrimethylammonium salt in which the alkyl radical comprises 12 to 22 carbon atoms.

39. A composition according to Claim 38, wherein the quaternary ammonium salt of formula (V) is distearyldimethylammonium chloride, cetyltrimethylammonium chloride, or behenyltrimethylammonium chloride.

40. A composition according to Claim 32, wherein the quaternary ammonium salt of formula (V) is a di(C₁-C₂ alkyl)(C₁₂-C₂₂alkyl)hydroxy(C₁-C₂alkyl)ammonium salt.

41. A composition according to Claim 40, wherein the quaternary ammonium salt of formula (V) is oleocetyldimethylhydroxyethylammonium chloride.

42. A composition according to Claim 32, wherein the quaternary ammonium salt of formula (V) is stearamidopropyldimethyl (myristyl acetate) ammonium chloride of formula:



43. A composition according to Claim 32, wherein said at least one quaternary ammonium salt is present in an amount ranging from 0.01 to 10% by weight of the total weight of the composition.

44. A composition according to Claim 43, wherein said at least one quaternary ammonium salt is present in an amount ranging from 0.05 to 5% by weight of the total weight of the composition.

45. A composition according to Claim 32, wherein said medium suitable for dyeing comprises water or a mixture of water and at least one organic solvent.

46. A composition according to Claim 32, wherein the composition has a pH ranging from 2 to 11.

47. A composition according to Claim 46, wherein the pH ranges from 5 to 10.

48. A composition according to Claim 32, further comprising at least one oxidation base chosen from para-phenylenediamines, bis-phenylalkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases.

49. A composition according to Claim 48, wherein said at least one oxidation base is present in an amount ranging from 0.0005 to 12% by weight of the total weight of the composition.

50. A composition according to Claim 49, wherein said at least one oxidation base is present in an amount ranging from 0.005 to 6% by weight of the total weight of the composition.

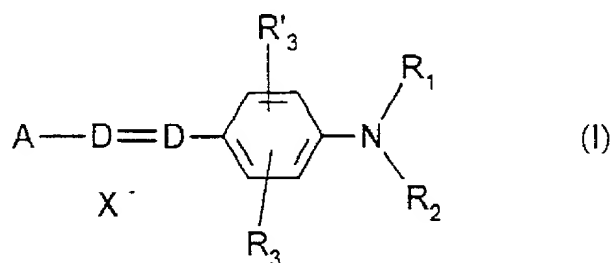
51. A composition according to Claim 48, further comprising at least one coupler chosen from meta-phenylenediamines, meta-aminophenols, meta-diphenols and heterocyclic couplers.

52. A composition according to Claim 51, wherein said at least one coupler is present in an amount ranging from 0.0001 to 10% by weight of the total weight of the composition.

60. A composition according to Claim 59, wherein said human keratinous fibers are hair.

61. A method for dyeing keratinous fibers, comprising:
applying to said keratinous fibers for a time sufficient to develop a desired color,
a composition comprising, in a medium suitable for dyeing,
(i) at least one cationic direct dye chosen from:

a) cationic direct dyes of formula (I):



in which:

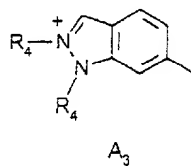
D is a nitrogen atom or a -CH group,

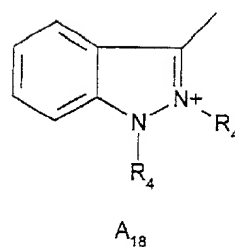
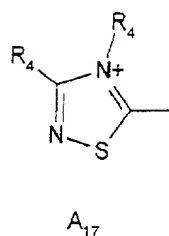
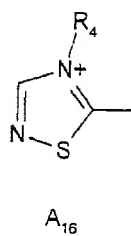
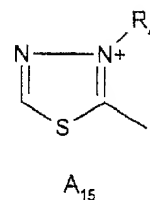
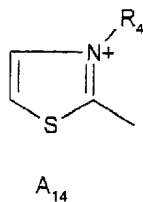
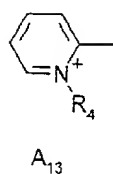
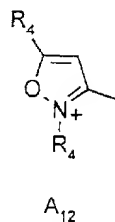
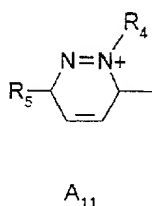
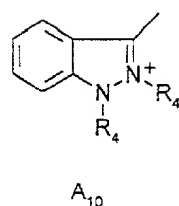
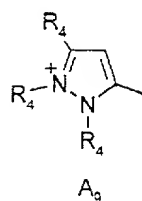
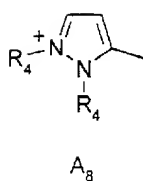
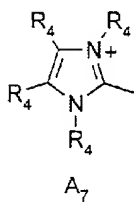
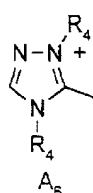
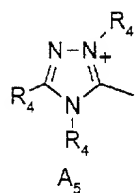
R₁ and R₂, which are identical or different, are chosen from a hydrogen atom; a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂ radical or form with each other or a carbon atom of the benzene ring a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with at least one C₁-C₄ alkyl radical; and a 4'-aminophenyl radical,

Year	Age	Sex	Height	Weight	Body Mass Index	Waist Circumference	Hip Circumference	Waist-Hip Ratio	Trunk Fat	Visceral Fat	Subcutaneous Fat	Trunk Fat	Visceral Fat	Subcutaneous Fat
1990	20	M	1.75	75	24.2	95	105	0.90	15	10	5	15	10	5
1995	25	F	1.65	65	23.8	85	95	0.89	12	8	4	12	8	4
2000	30	M	1.80	85	26.2	105	115	0.91	18	12	6	18	12	6
2005	35	F	1.70	70	24.2	90	100	0.90	14	9	5	14	9	5
2010	40	M	1.85	95	27.8	115	125	0.92	20	14	6	20	14	6
2015	45	F	1.75	80	25.7	100	110	0.91	16	11	5	16	11	5
2020	50	M	1.90	105	29.4	125	135	0.93	22	16	6	22	16	6
2025	55	F	1.80	90	27.8	110	120	0.92	18	13	5	18	13	5
2030	60	M	1.95	115	30.5	135	145	0.93	24	18	6	24	18	6
2035	65	F	1.85	100	29.2	120	130	0.92	20	15	5	20	15	5
2040	70	M	2.00	125	31.3	145	155	0.94	26	20	6	26	20	6
2045	75	F	1.90	110	30.6	130	140	0.93	22	17	5	22	17	5
2050	80	M	2.05	135	32.5	155	165	0.94	28	22	6	28	22	6
2055	85	F	1.95	120	30.9	140	150	0.93	24	19	5	24	19	5
2060	90	M	2.10	145	33.3	165	175	0.95	30	24	6	30	24	6
2065	95	F	2.00	130	32.3	150	160	0.94	26	21	5	26	21	5
2070	100	M	2.15	155	34.4	175	185	0.96	32	26	6	32	26	6
2075	105	F	2.05	140	33.7	160	170	0.95	28	23	5	28	23	5
2080	110	M	2.20	165	35.0	185	195	0.97	34	28	6	34	28	6
2085	115	F	2.10	150	34.0	170	180	0.96	30	25	5	30	25	5
2090	120	M	2.25	175	35.6	195	205	0.98	36	30	6	36	30	6
2095	125	F	2.15	160	34.9	180	190	0.97	32	27	5	32	27	5
2100	130	M	2.30	185	36.1	205	215	0.99	38	32	6	38	32	6
2105	135	F	2.20	170	35.0	190	200	0.98	34	29	5	34	29	5
2110	140	M	2.35	195	37.0	215	225	1.00	40	34	6	40	34	6
2115	145	F	2.25	180	36.0	200	210	0.99	36	31	5	36	31	5
2120	150	M	2.40	205	37.5	225	235	1.01	42	36	6	42	36	6
2125	155	F	2.30	190	36.5	210	220	1.00	38	33	5	38	33	5
2130	160	M	2.45	215	38.0	235	245	1.02	44	38	6	44	38	6
2135	165	F	2.35	200	37.5									

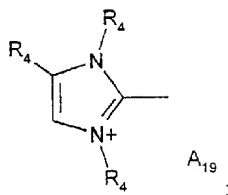
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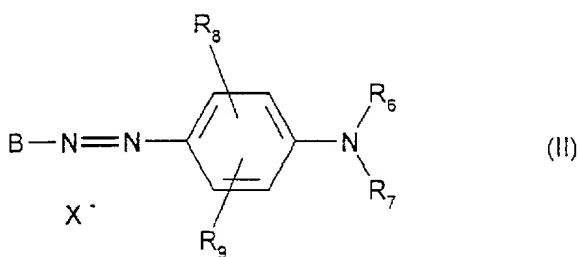
and



in which R_4 is a C_1 - C_4 alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R_5 is a C_1 - C_4 alkoxy radical,

with the proviso that when D represents $-CH$, A is A_4 or A_{13} and R_3 is different from an alkoxy radical, then R_1 and R_2 are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



in which:

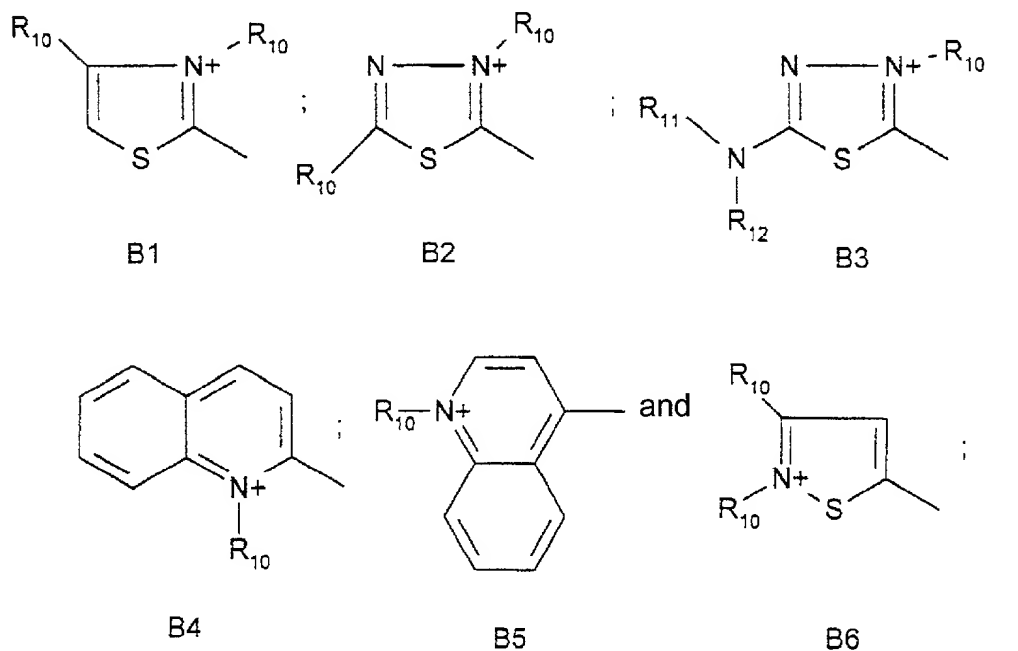
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

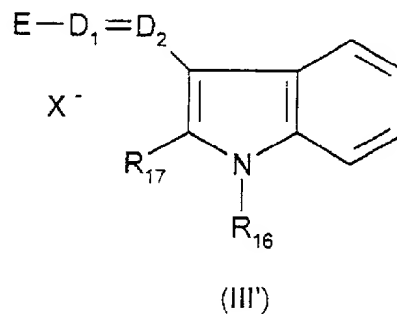
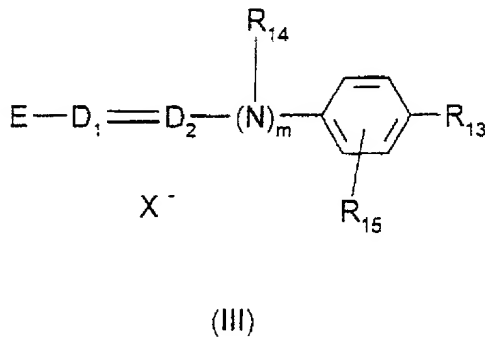
X^- is an anion,

B represents a group chosen from the following structures B1 to B6:



in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

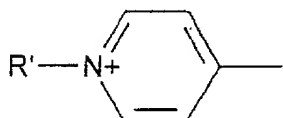
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

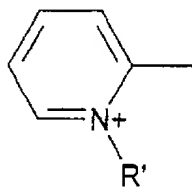
with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

X^- is an anion,

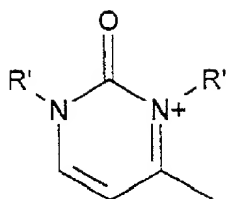
E is a group chosen from the following structures E1 to E8:



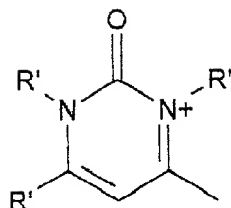
E1



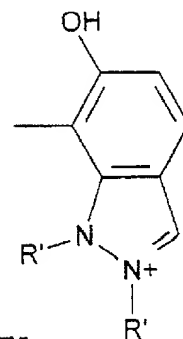
E2



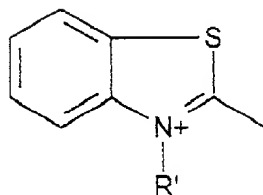
E3



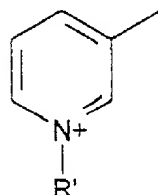
E4



E5

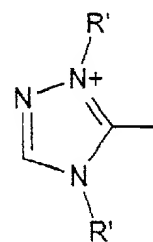


E6



E7

and



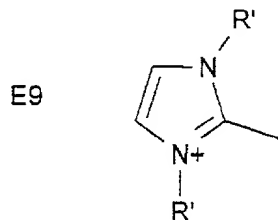
E8

in which R' is a C₁-C₄ alkyl radical;

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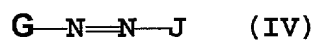
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when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



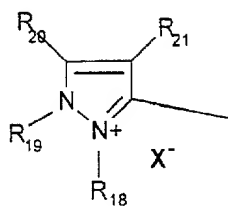
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

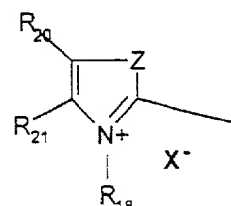


in which:

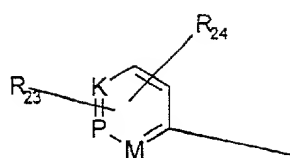
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

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R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$ where r is zero or 1;

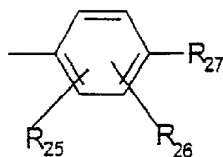
R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :



J₁

in which structure J₁,

R₂₅ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and a radical chosen from -OH, -NO₂, -NHR₂₈, -NR₂₉R₃₀, and -NHCO(C₁-C₄alkyl), or forms with R₂₆ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R₂₆ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; and a C₁-C₄ alkoxy radical, or forms with R₂₇ or R₂₈ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R₂₇ is chosen from a hydrogen atom, an -OH radical, an -NHR₂₈ radical, and an -NR₂₉R₃₀ radical;

R₂₈ is chosen from a hydrogen atom, a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, and a phenyl radical;

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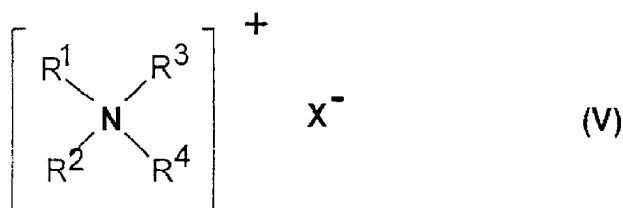
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R₂₉ and R₃₀, which are identical or different, are chosen from a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

(ii) at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):



in which

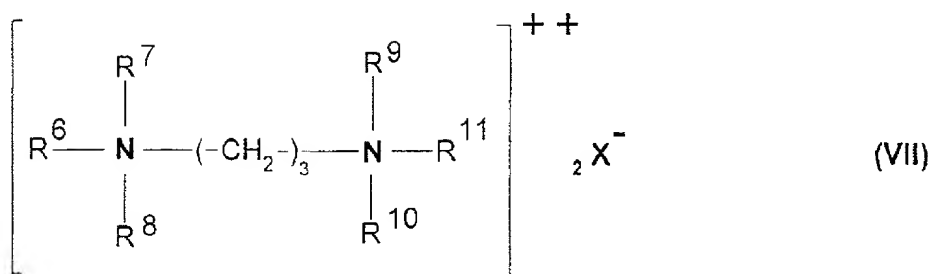
the radicals R¹, R², R³, and R⁴, which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxycarbonylalkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl,

X⁻ is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

$$\left[\begin{array}{c} \text{R}^5 \\ | \\ \text{N} \diagup \text{C} \diagdown \\ | \quad | \\ \text{N} \quad \text{CH}_2\text{-CH}_2\text{-NH-CO-R}^5 \\ | \\ \text{CH}_3 \end{array} \right]^+ + \text{CH}_3\text{SO}_4^- \quad (\text{VI})$$

R⁵ is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):



in which

R⁶ is an aliphatic radical comprising 16 to 30 carbon atoms,

R⁷, R⁸, R⁹, R¹⁰ and R¹¹ are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X⁻ is an anion chosen from halides, acetates, phosphates and sulphates.

62. A method according to claim 61, further comprising rinsing said keratinous fibers after applying said composition thereon.

63. A method according to claim 62, further comprising
washing said keratinous fibers with shampoo after said rinsing;
and rinsing again said keratinous fibers after said washing.

64. A method according to claim 63, further comprising, after said washing and rinsing, drying said keratinous fibers.

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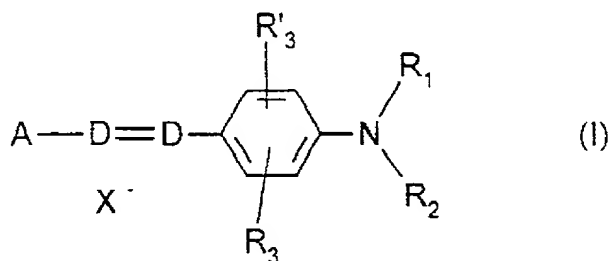
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[illegible]

Variable	Mean	SD	Min	Max
Age	38.5	10.5	25	55
Gender	Male	Female	Male	Female
Marital status	Married	Single	Married	Single
Education	High school	College	High school	College
Occupation	Manager	Worker	Manager	Worker
Income	\$30,000	\$40,000	\$20,000	\$50,000
Health status	Good	Poor	Good	Poor
Smoking status	Smoker	Non-smoker	Smoker	Non-smoker
Alcohol consumption	Regular	Occasional	Regular	Occasional
Exercise frequency	Weekly	Monthly	Weekly	Monthly
Stress level	High	Low	High	Low
Sleep quality	Good	Poor	Good	Poor
Dietary habits	Healthy	Unhealthy	Healthy	Unhealthy
Family size	2	3	1	4
Work-life balance	Good	Poor	Good	Poor
Life satisfaction	High	Low	High	Low
Overall well-being	Excellent	Fair	Excellent	Fair

67. A method for dyeing keratinous fibers, comprising
separately storing a first composition and a second composition;
mixing said first composition with said second composition before applying the
resultant mixture to said keratinous fibers; and
applying said mixture to the keratinous fibers,
wherein said first composition comprises, in a medium suitable for dyeing, at
least one oxidation base and
at least one cationic direct dye chosen from:

a) cationic direct dyes of formula (I):



in which:

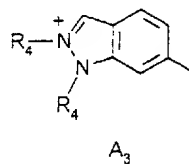
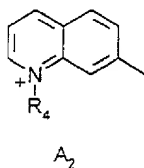
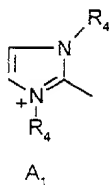
D is a nitrogen atom or a -CH group,

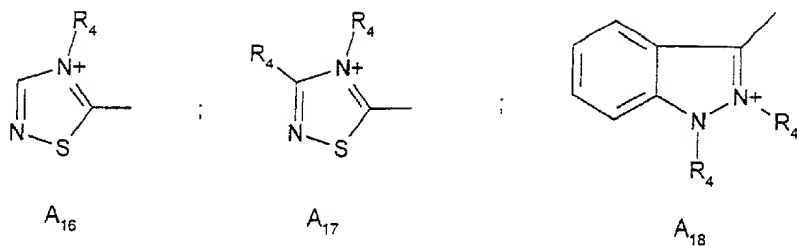
R_1 and R_2 , which are identical or different, are chosen from a hydrogen atom; a C_1 - C_4 alkyl radical which is unsubstituted or substituted with a $-CN$, $-OH$ or $-NH_2$ radical or form with each other or a carbon atom of the benzene ring a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with at least one C_1 - C_4 alkyl radical; and a 4'-aminophenyl radical,

R_3 and R'_3 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a cyano radical; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an acetyloxy radical,

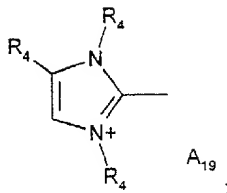
X^- is an anion,

A is a group chosen from the following structures A_1 to A_{19} :





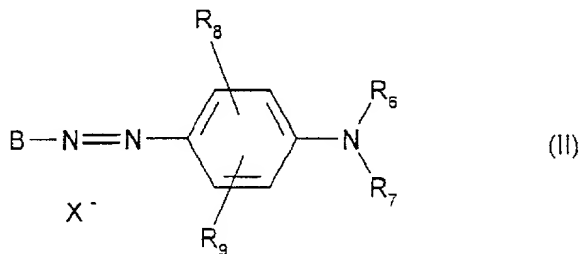
and



in which R_4 is a C_1 - C_4 alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R_5 is a C_1 - C_4 alkoxy radical,

with the proviso that when D represents $-CH$, A is A_4 or A_{13} and R_3 is different from an alkoxy radical, then R_1 and R_2 are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



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in which:

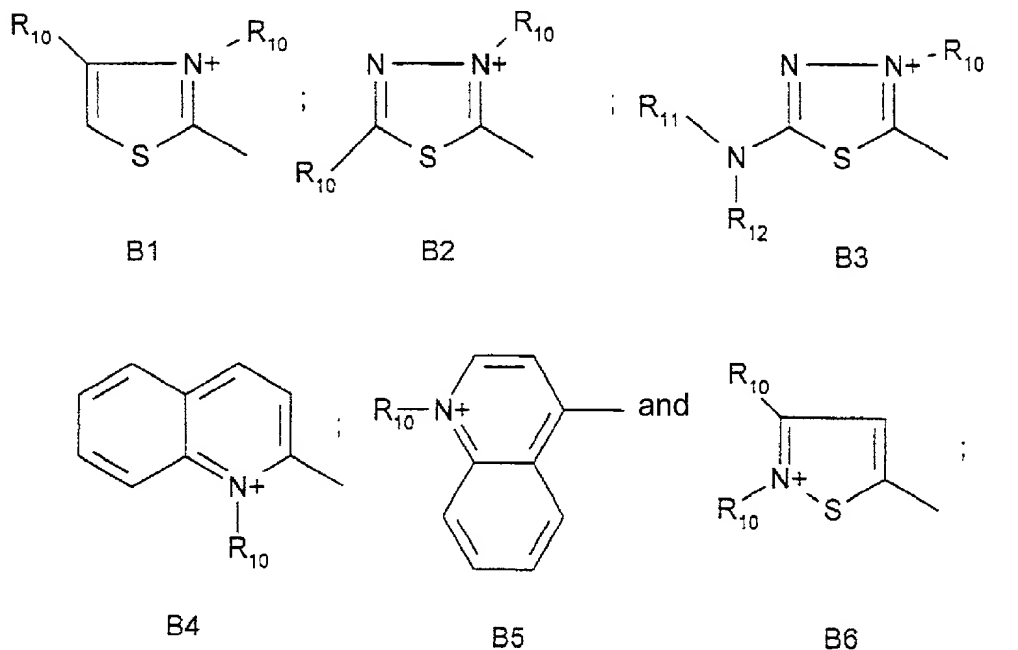
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

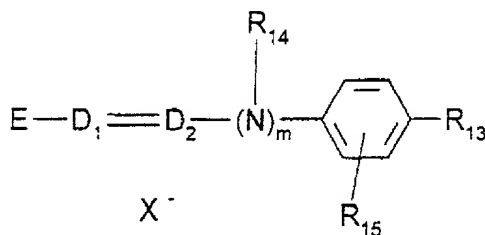
X^- is an anion,

B represents a group chosen from the following structures B1 to B6:

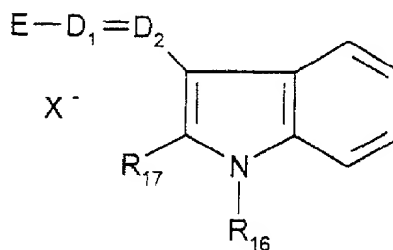


in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



(III)



(III')

in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

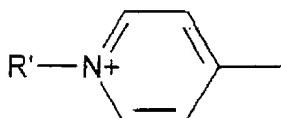
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

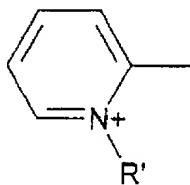
with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

X^- is an anion,

E is a group chosen from the following structures E1 to E8:



E1



E2



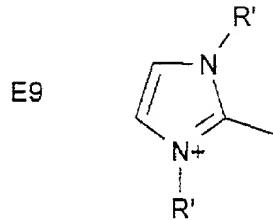
and



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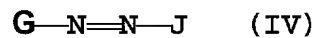
- 47 -

when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



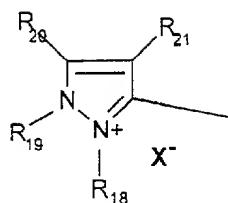
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

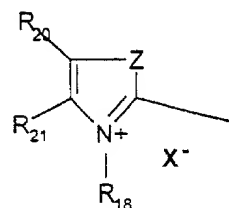


in which:

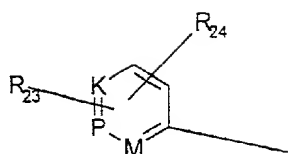
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

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R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$ where r is zero or 1;

R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

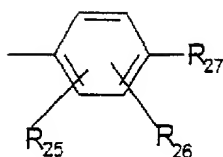
X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :

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J₁

in which structure J₁,

R₂₅ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and a radical chosen from -OH, -NO₂, -NHR₂₈, -NR₂₉R₃₀, and -NHCO(C₁-C₄alkyl), or forms with R₂₆ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R₂₆ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; and a C₁-C₄ alkoxy radical, or forms with R₂₇ or R₂₈ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R₂₇ is chosen from a hydrogen atom, an -OH radical, an -NHR₂₈ radical, and an -NR₂₉R₃₀ radical;

R₂₈ is chosen from a hydrogen atom, a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, and a phenyl radical;

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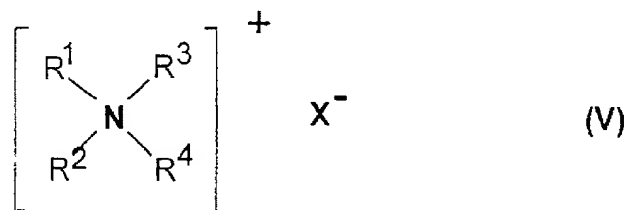
R₂₉ and R₃₀, which are identical or different, are chosen from a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

wherein said second composition comprises, in a medium suitable for dyeing, at least one oxidizing agent; and

wherein either said first composition or said second composition further comprises at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):

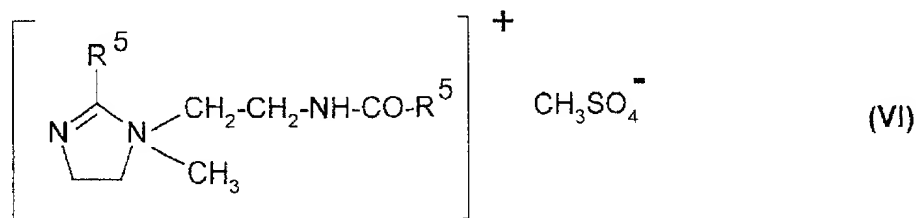


in which

the radicals R^1 , R^2 , R^3 , and R^4 , which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxy carbonyl alkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl and alkylaryl radicals comprising 12 to 30 carbon atoms, wherein at least one radical among R^1 , R^2 , R^3 and R^4 is a radical comprising 8 to 30 carbon atoms;

X^- is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

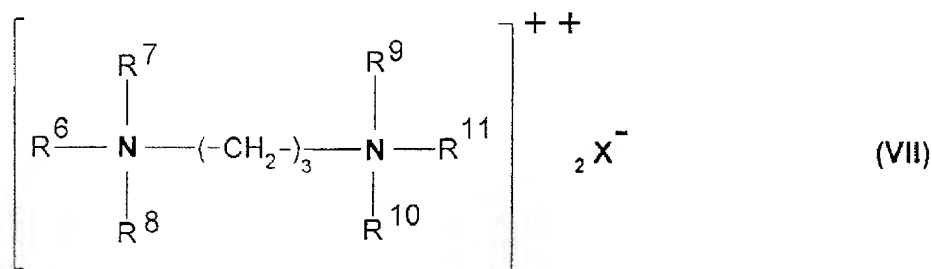
(ii)₂ - imidazolium salts of the following formula (VI):



in which

R⁵ is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):



in which

R⁶ is an aliphatic radical comprising 16 to 30 carbon atoms,

R⁷, R⁸, R⁹, R¹⁰ and R¹¹ are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X⁻ is an anion chosen from halides, acetates, phosphates and sulphates.

68. A method according to claim 67, wherein said keratinous fibers are human

keratinous fibers.

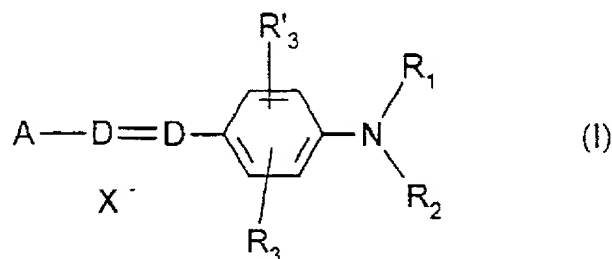
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hair.

70. A method for dyeing keratinous fibers, comprising
separately storing a first composition and a second composition;
mixing said first composition with said second composition before applying the
resultant mixture to said keratinous fibers; and
applying said mixture to the keratinous fibers,
wherein said first composition comprises, in a medium suitable for dyeing:
at least one cationic direct dye chosen from:

a) cationic direct dyes of formula (I):



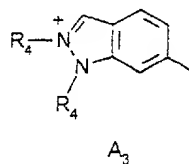
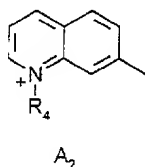
in which:

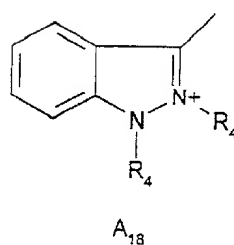
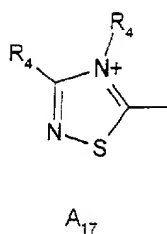
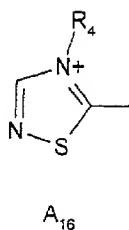
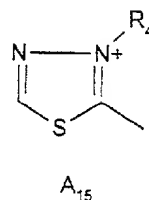
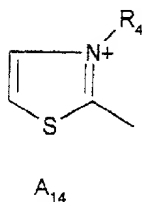
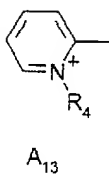
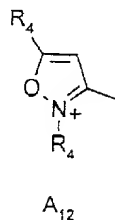
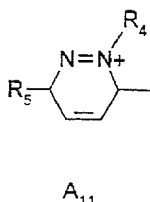
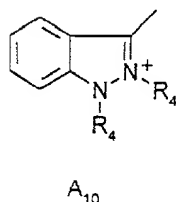
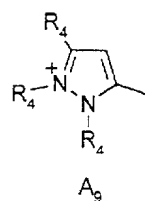
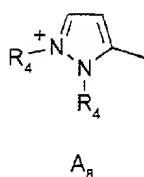
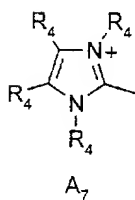
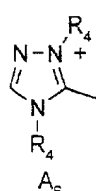
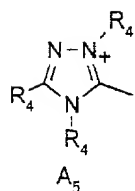
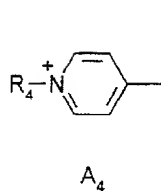
D is a nitrogen atom or a -CH group,

R₁ and R₂, which are identical or different, are chosen from a hydrogen
atom; a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂

R₃ and R'₃, which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a cyano radical; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and an acetyloxy radical,

A is a group chosen from the following structures A_1 to A_{19} :



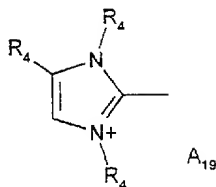


in the case of the present invention, the structure of the compound is not limited to the above-described structure, and it is possible to use a compound having a structure similar to the above-described structure.

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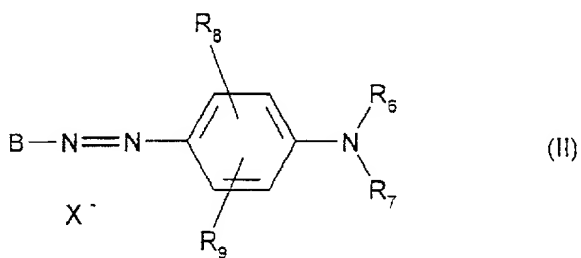
and



in which R₄ is a C₁-C₄ alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R₅ is a C₁-C₄ alkoxy radical,

with the proviso that when D represents -CH, A is A₄ or A₁₃ and R₃ is different from an alkoxy radical, then R₁ and R₂ are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



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in which:

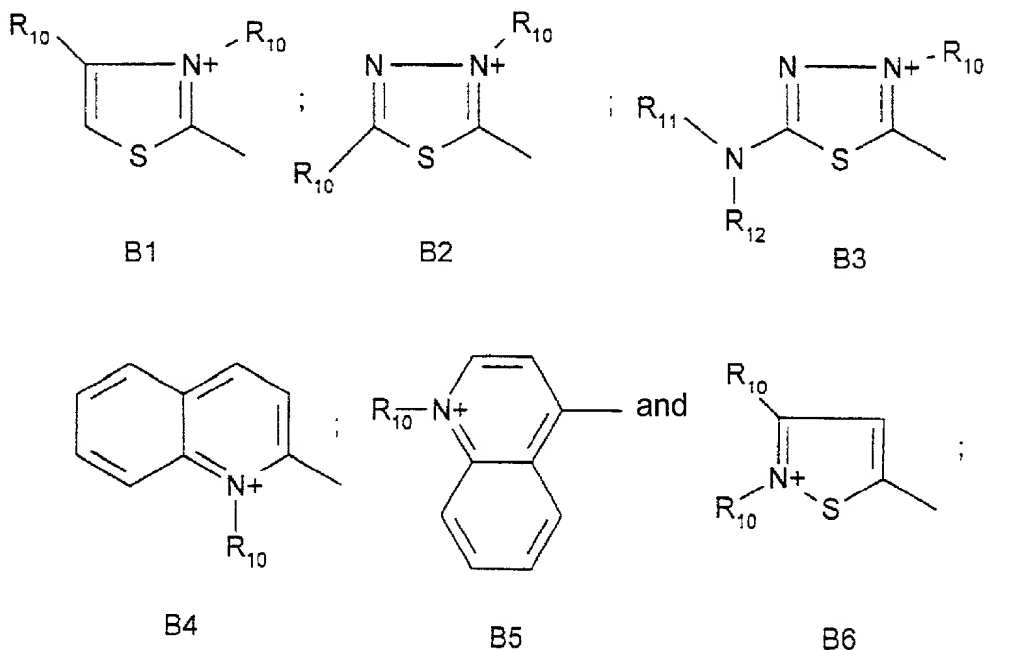
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

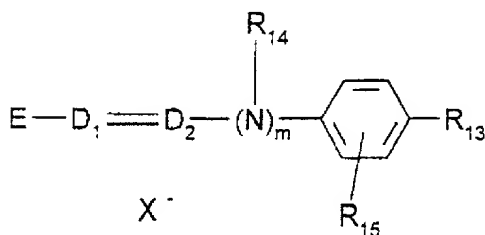
X^- is an anion,

B represents a group chosen from the following structures B1 to B6:

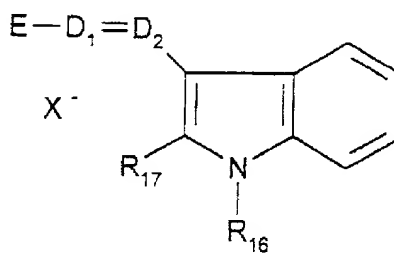


in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



(III)



(III')

in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

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R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

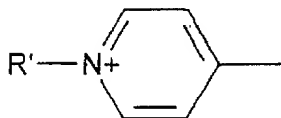
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

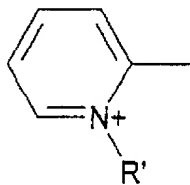
with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

X^- is an anion,

E is a group chosen from the following structures E1 to E8:



E1

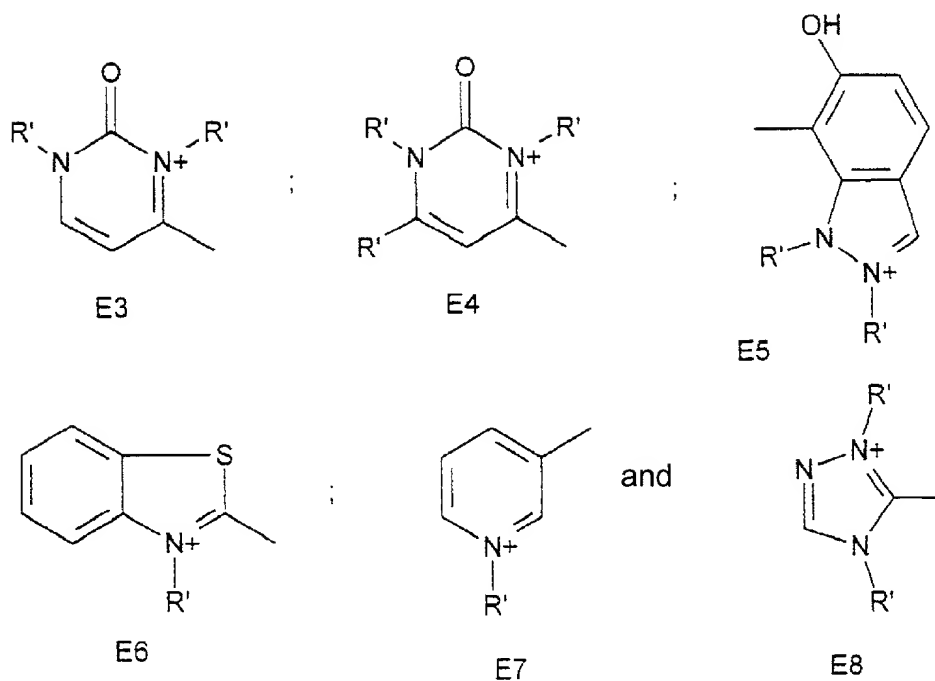


E2

;

;

and that the group R' is not a hydrogen atom.

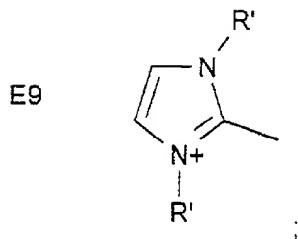


in which R' is a C₁-C₄ alkyl radical;

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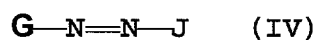
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when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



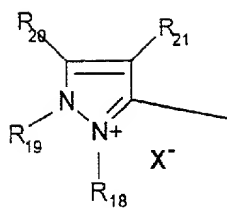
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

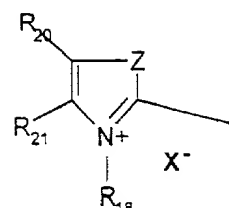


in which:

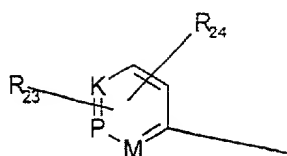
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$ where r is zero or 1;

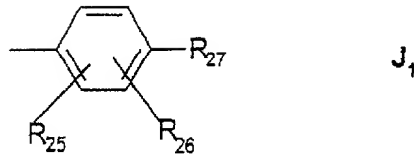
R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :



in which structure J₁,

R₂₅ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and a radical chosen from -OH, -NO₂, -NHR₂₈, -NR₂₉R₃₀, and -NHCO(C₁-C₄alkyl), or forms with R₂₆ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R₂₆ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; and a C₁-C₄ alkoxy radical, or forms with R₂₇ or R₂₈ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R₂₇ is chosen from a hydrogen atom, an -OH radical, an -NHR₂₈ radical, and an -NR₂₉R₃₀ radical;

R₂₈ is chosen from a hydrogen atom, a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, and a phenyl radical;

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R₂₉ and R₃₀, which are identical or different, are chosen from a C₁-C₄ alkyl radical, a

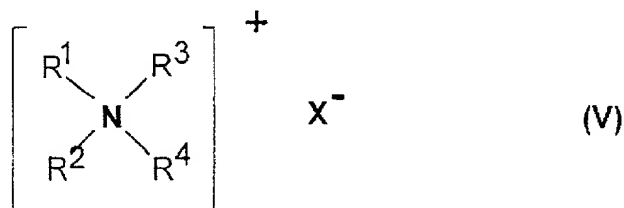
C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

wherein said second composition comprises, in a medium suitable for dyeing, at least one oxidizing agent; and

wherein either said first composition or said second composition further comprises at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):

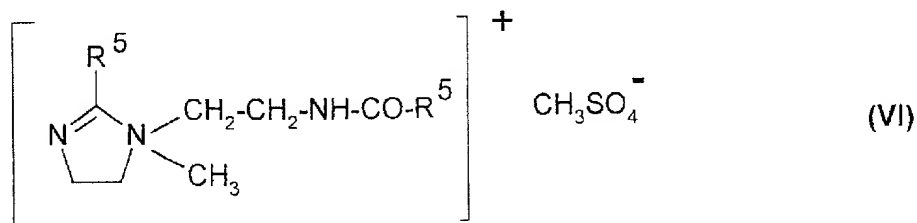


in which

the radicals R^1 , R^2 , R^3 , and R^4 , which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxy carbonyl alkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl and alkylaryl radicals comprising 12 to 30 carbon atoms, wherein at least one radical among R^1 , R^2 , R^3 and R^4 is a radical comprising 8 to 30 carbon atoms;

X^- is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

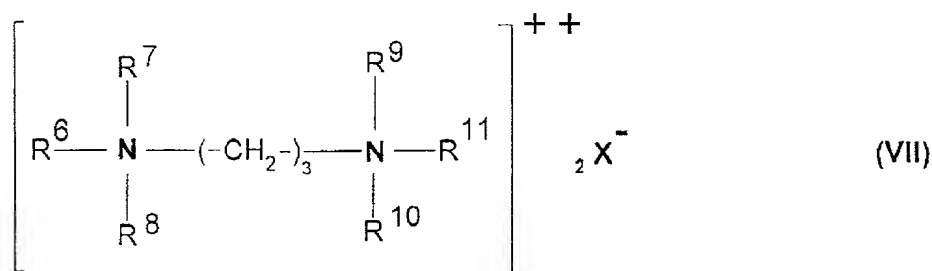
(ii)₂ - imidazolium salts of the following formula (VI):



in which

R⁵ is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):



in which

R⁶ is an aliphatic radical comprising 16 to 30 carbon atoms,

R⁷, R⁸, R⁹, R¹⁰ and R¹¹ are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X⁻ is an anion chosen from halides, acetates, phosphates and sulphates.

71. A method according to claim 70, wherein said keratinous fibers are human keratinous fibers.

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72. A method according to claim 71, wherein said human keratinous fibers are hair.

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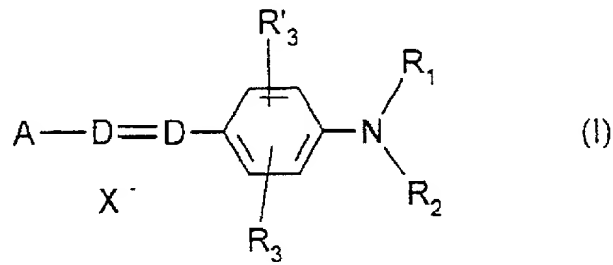
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73. A multicompartment dyeing kit wherein a first compartment contains a first composition and a second compartment contains a second composition,

wherein said first composition comprises, in a medium suitable for dyeing, at least one oxidation base and

at least one cationic direct dye chosen from:

a) cationic direct dyes of formula (I):



in which:

D is a nitrogen atom or a -CH group,

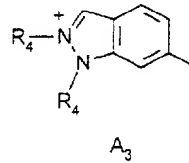
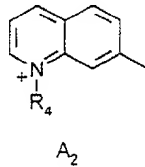
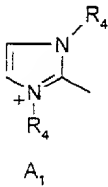
R₁ and R₂, which are identical or different, are chosen from a hydrogen atom; a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂ radical or form with each other or a carbon atom of the benzene ring a heterocycle

optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with at least one C₁-C₄ alkyl radical; and a 4'-aminophenyl radical,

R₃ and R'₃, which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a cyano radical; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and an acetyloxy radical,

X⁻ is an anion,

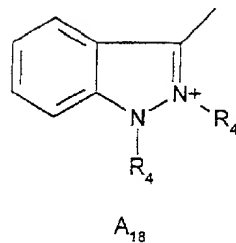
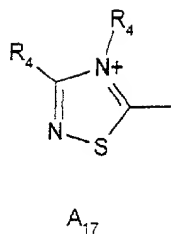
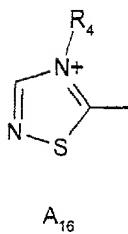
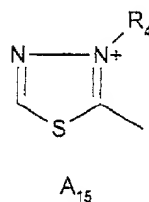
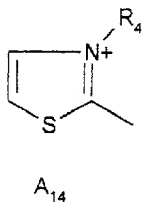
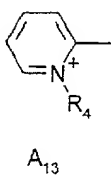
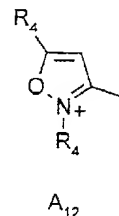
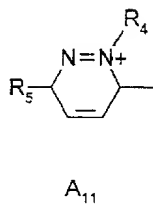
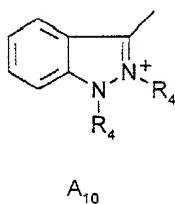
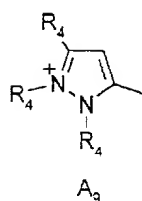
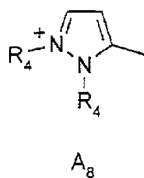
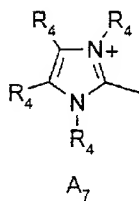
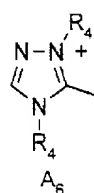
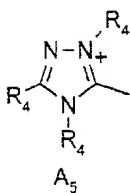
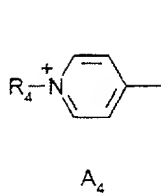
A is a group chosen from the following structures A₁ to A₁₉:



and the group A is chosen from the following structures A₁ to A₁₉:

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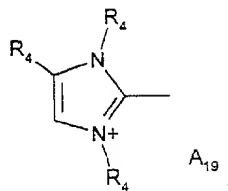


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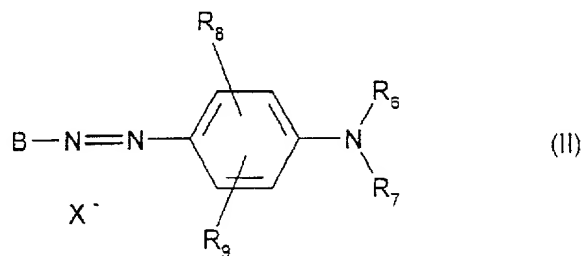
and



in which R₄ is a C₁-C₄ alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R₅ is a C₁-C₄ alkoxy radical,

with the proviso that when D represents -CH, A is A₄ or A₁₃ and R₃ is different from an alkoxy radical, then R₁ and R₂ are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



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in which:

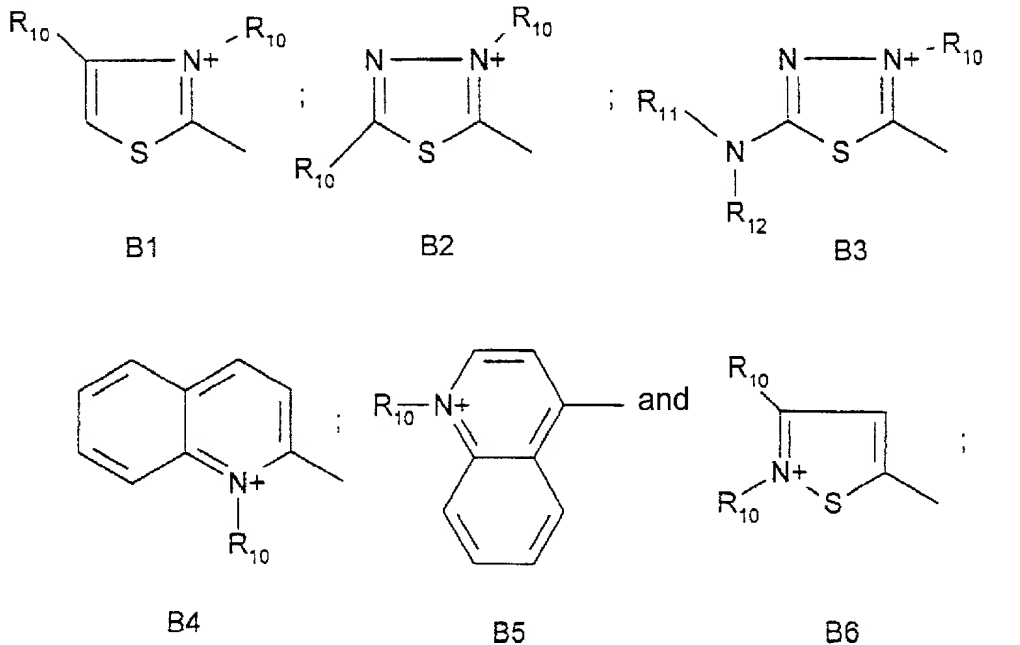
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

X^- is an anion,

B represents a group chosen from the following structures B1 to B6:

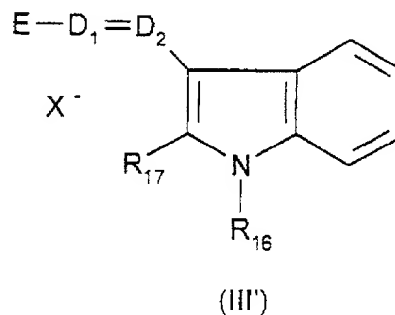
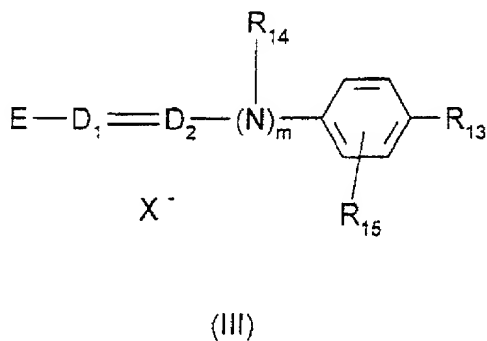


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in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

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R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

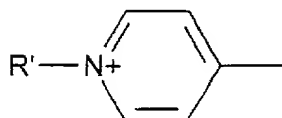
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

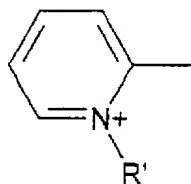
with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

X^- is an anion,

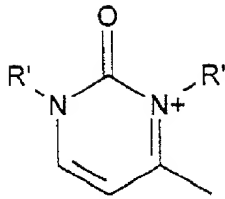
E is a group chosen from the following structures E1 to E8:



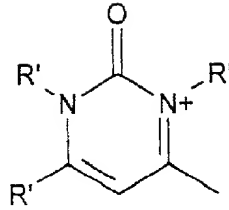
E1



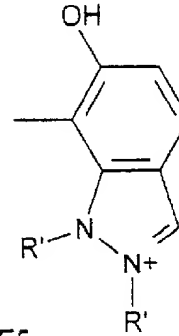
E2



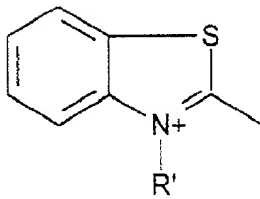
E3



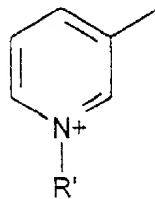
E4



E5

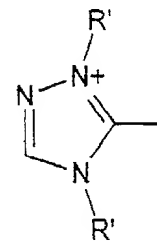


E6



E7

and



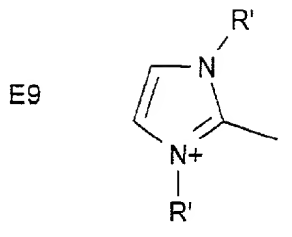
E8

in which R' is a C₁-C₄ alkyl radical;

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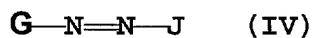
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when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



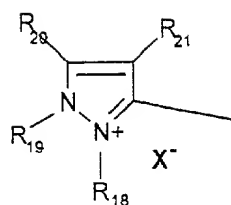
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

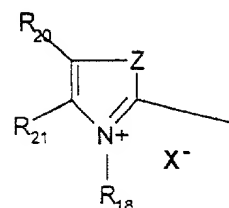


in which:

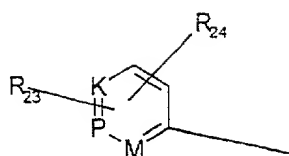
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

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R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$ where r is zero or 1;

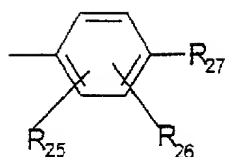
R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :



J₁

in which structure J₁,

R₂₅ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and a radical chosen from -OH, -NO₂, -NHR₂₈, -NR₂₉R₃₀, and -NHCO(C₁-C₄alkyl), or forms with R₂₆ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R₂₆ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; and a C₁-C₄ alkoxy radical, or forms with R₂₇ or R₂₈ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R₂₇ is chosen from a hydrogen atom, an -OH radical, an -NHR₂₈ radical, and an -NR₂₉R₃₀ radical;

R₂₈ is chosen from a hydrogen atom, a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, and a phenyl radical;

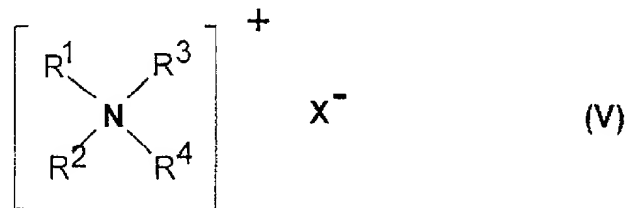
R₂₉ and R₃₀, which are identical or different, are chosen from a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

wherein said second composition comprises, in a medium suitable for dyeing, at least one oxidizing agent; and

wherein either said first composition or said second composition further comprises at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):

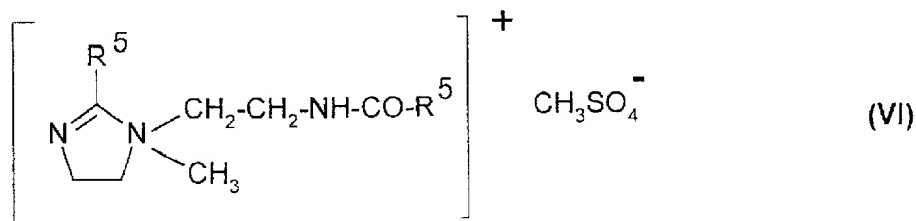


in which

the radicals R^1 , R^2 , R^3 , and R^4 , which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxycarbonylalkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl and alkylaryl radicals comprising 12 to 30 carbon atoms, wherein at least one radical among R^1 , R^2 , R^3 and R^4 is a radical comprising 8 to 30 carbon atoms;

X^- is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

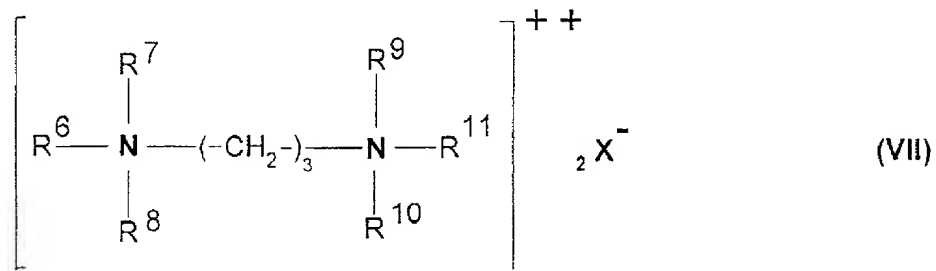
(ii)₂ - imidazolium salts of the following formula (VI):



in which

R⁵ is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):



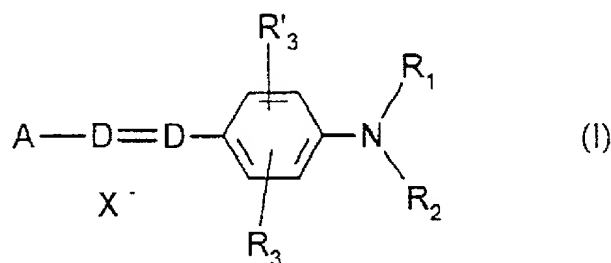
in which

R⁶ is an aliphatic radical comprising 16 to 30 carbon atoms,

R⁷, R⁸, R⁹, R¹⁰ and R¹¹ are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X⁻ is an anion chosen from halides, acetates, phosphates and sulphates.

74. A multicompartment dyeing kit wherein a first compartment contains a first composition and a second compartment contains a second composition, wherein said first composition comprises, in a medium suitable for dyeing: at least one cationic direct dye chosen from:

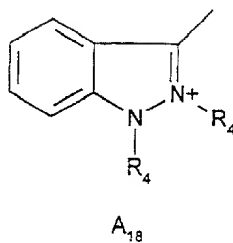
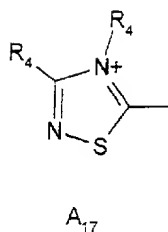
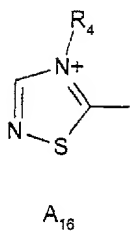
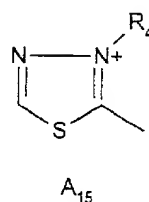
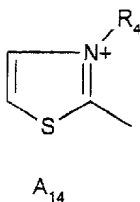
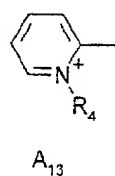
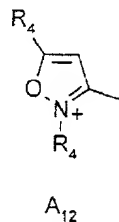
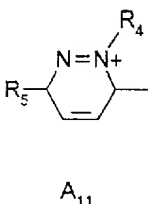
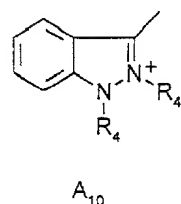
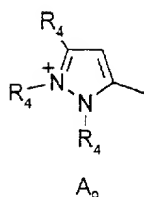
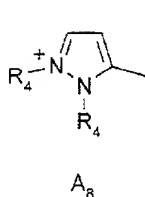
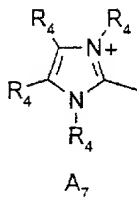
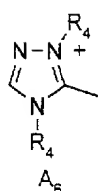
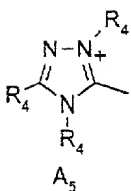
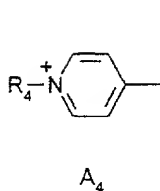
a) cationic direct dyes of formula (I):



in which:

D is a nitrogen atom or a -CH group,

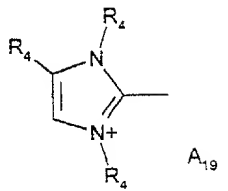
R₁ and R₂, which are identical or different, are chosen from a hydrogen atom; a C₁-C₄ alkyl radical which is unsubstituted or substituted with a -CN, -OH or -NH₂ radical or form with each other or a carbon atom of the benzene ring a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with at least one C₁-C₄ alkyl radical; and a 4'-aminophenyl radical,



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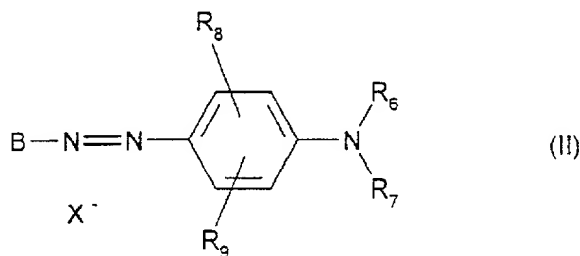
and



in which R₄ is a C₁-C₄ alkyl radical which is unsubstituted or substituted with a hydroxyl radical and R₅ is a C₁-C₄ alkoxy radical,

with the proviso that when D represents -CH, A is A₄ or A₁₃ and R₃ is different from an alkoxy radical, then R₁ and R₂ are not simultaneously hydrogen atoms;

b) cationic direct dyes of formula (II):



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in which:

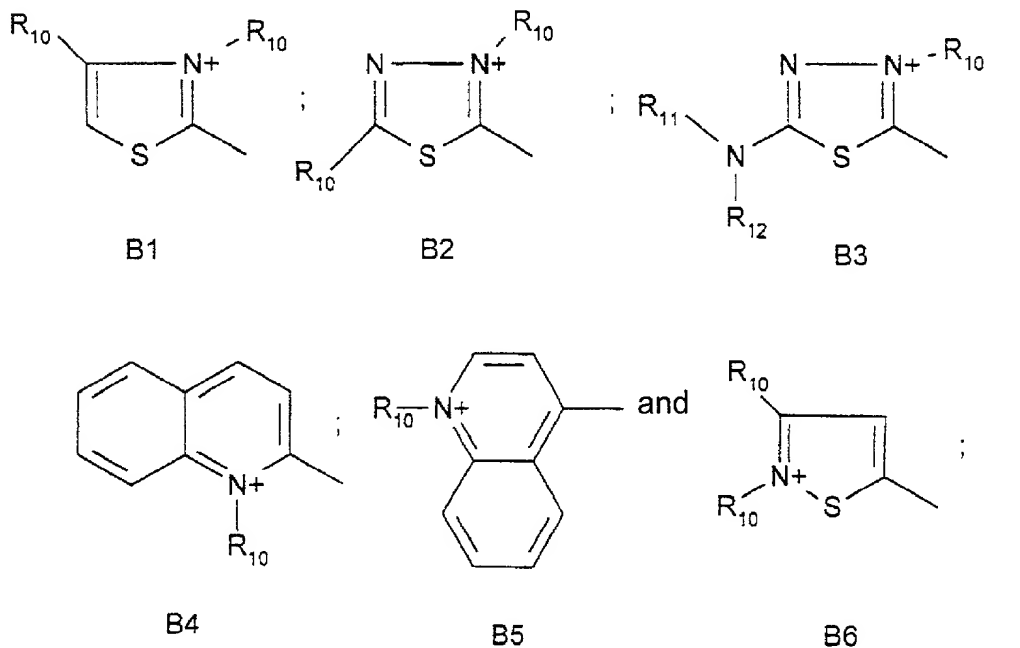
R_6 is a hydrogen atom or a C_1 - C_4 alkyl radical,

R_7 is chosen from a hydrogen atom; an alkyl radical which is unsubstituted or substituted with a -CN radical or with an amino group; and a 4'-aminophenyl radical, or forms with R_6 a heterocycle optionally containing at least one of oxygen and nitrogen and which is unsubstituted or substituted with a C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from bromine, chlorine, fluorine, and iodine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and a -CN radical,

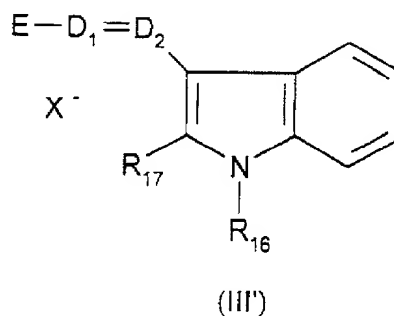
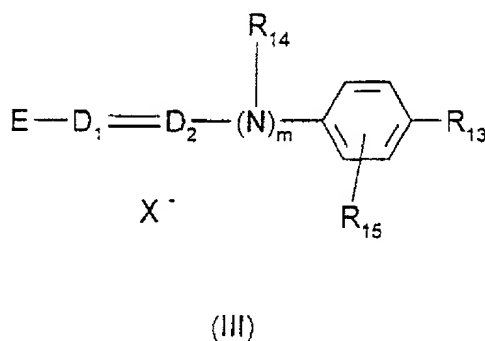
X^- is an anion,

B represents a group chosen from the following structures B1 to B6:



in which R_{10} is a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical;

c) cationic direct dyes of the following formula (III) and formula (III'):



in which:

R_{13} is chosen from a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom chosen from bromine, chlorine, fluorine, and iodine; and an amino radical,

R_{14} is a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and is unsubstituted or substituted with at least one C_1 - C_4 alkyl group,

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R_{15} is a hydrogen or halogen atom chosen from bromine, chlorine, fluorine, and iodine,

R_{16} and R_{17} , which are identical or different, are a hydrogen atom or a C_1 - C_4 alkyl radical,

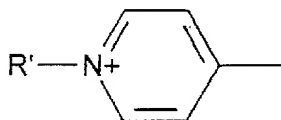
D_1 and D_2 , which are identical or different, are a nitrogen atom or a -CH group,

$m = 0$ or 1 ,

with the proviso that when R_{13} is an unsubstituted amino group, then D_1 and D_2 simultaneously are -CH groups and $m = 0$,

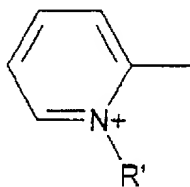
X^- is an anion,

E is a group chosen from the following structures E1 to E8:



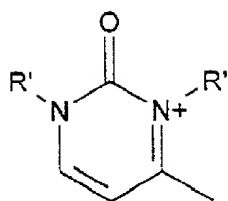
E1

;

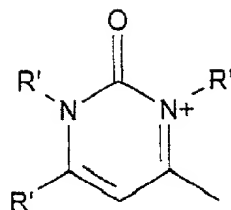


E2

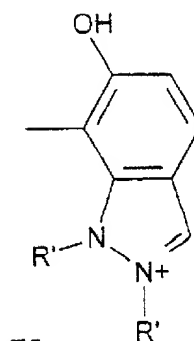
;



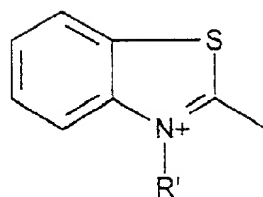
E3



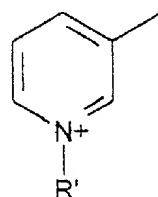
E4



E5

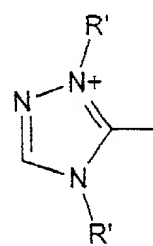


E6



E7

and



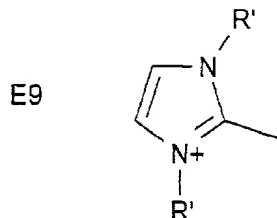
E8

in which R' is a C₁-C₄ alkyl radical;

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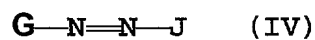
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when $m = 0$ and D_1 is a nitrogen atom, then E may also be a group having the following structure E9:



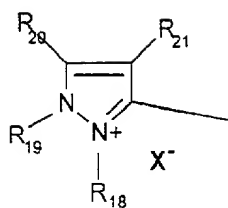
in which R' is a C_1 - C_4 alkyl radical, and

d) cationic direct dyes of formula (IV):

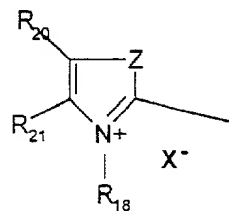


in which:

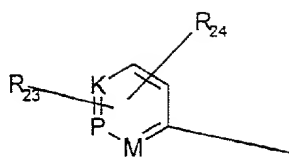
the symbol G is a group chosen from the following structures G_1 to G_3 :



G₁



G₂



G₃

in which structures G₁ to G₃,

R₁₈ is chosen from a C₁-C₄ alkyl radical; a phenyl radical which is unsubstituted or substituted with a C₁-C₄ alkyl radical or with a halogen atom chosen from chlorine, bromine, iodine and fluorine;

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R_{19} is a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, are chosen from a C_1 - C_4 alkyl radical and a phenyl radical, or form together in G_1 a benzene ring which is substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals, or form together in G_2 a benzene ring which is optionally substituted with at least one radical chosen from C_1 - C_4 alkyl, C_1 - C_4 alkoxy and NO_2 radicals;

R_{20} may also be a hydrogen atom;

Z is an oxygen or sulphur atom or an $-NR_{19}$ group;

M is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)$;

K is a group chosen from $-CH$; $-CR$ wherein R is C_1 - C_4 alkyl; and $-NR_{22}(X^-)$;

P is a group chosen from $-CH$; $-CR$ wherein R denotes C_1 - C_4 alkyl; and $-NR_{22}(X^-)_r$ where r is zero or 1;

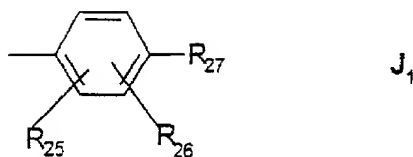
R_{22} is chosen from an O^- atom, a C_1 - C_4 alkoxy radical and a C_1 - C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, are chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C_1 - C_4 alkyl radical; a C_1 - C_4 alkoxy radical; and an $-NO_2$ radical;

X^- is an anion;

wherein J is chosen from:

-(a) a group having the following structure J_1 :



in which structure J₁,

R₂₅ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; a C₁-C₄ alkoxy radical; and a radical chosen from -OH, -NO₂, -NHR₂₈, -NR₂₉R₃₀, and -NHCO(C₁-C₄alkyl), or forms with R₂₆ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen and sulphur;

R₂₆ is chosen from a hydrogen atom; a halogen atom chosen from chlorine, bromine, iodine and fluorine; a C₁-C₄ alkyl radical; and a C₁-C₄ alkoxy radical, or forms with R₂₇ or R₂₈ a 5- or 6-membered ring optionally containing at least one heteroatom chosen from nitrogen, oxygen or sulphur;

R₂₇ is chosen from a hydrogen atom, an -OH radical, an -NHR₂₈ radical, and an -NR₂₉R₃₀ radical;

R₂₈ is chosen from a hydrogen atom, a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, and a phenyl radical;

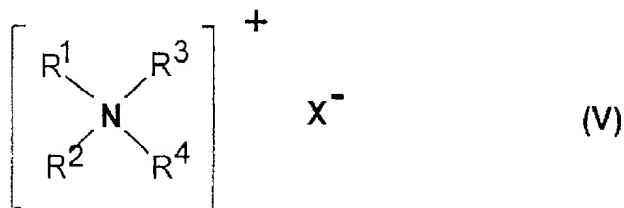
R₂₉ and R₃₀, which are identical or different, are chosen from a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical, and a C₂-C₄ polyhydroxyalkyl radical; and

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which optionally contains additional heteroatoms, carbonyl-containing groups, or a mixture of additional heteroatoms and carbonyl-containing groups and which is unsubstituted or substituted with at least one radical chosen from C₁-C₄ alkyl, amino and phenyl radicals, and

wherein said second composition comprises, in a medium suitable for dyeing, at least one oxidizing agent; and

wherein either said first composition or said second composition further comprises at least one quaternary ammonium salt chosen from:

(ii)₁ - quaternary ammonium salts of the following formula (V):

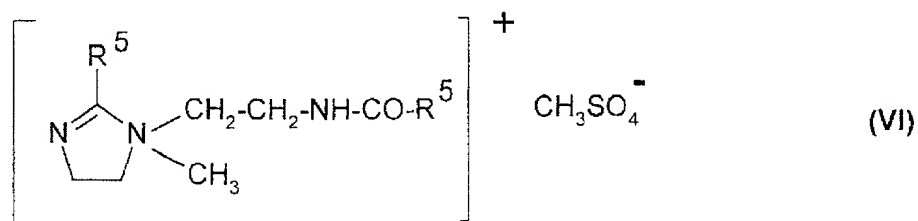


in which

the radicals R^1 , R^2 , R^3 , and R^4 , which are identical or different, are chosen from a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising 1 to 30 carbon atoms; and a radical chosen from alkoxy, alkoxycarbonylalkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl and alkylaryl radicals comprising 12 to 30 carbon atoms, wherein at least one radical among R^1 , R^2 , R^3 and R^4 is a radical comprising 8 to 30 carbon atoms;

X^- is an anion chosen from halides, phosphates, acetates, lactates and alkyl sulphates;

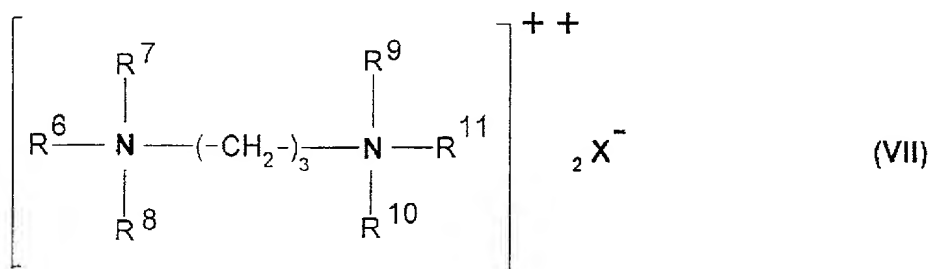
(ii)₂ - imidazolium salts of the following formula (VI):



in which

R⁵ is chosen from alkenyl radicals and alkyl radicals, said alkenyl radicals and alkyl radicals comprising 13 to 31 carbon atoms and being derived from tallow fatty acids;

(ii)₃ - quaternary diammonium salts of the following formula (VII):

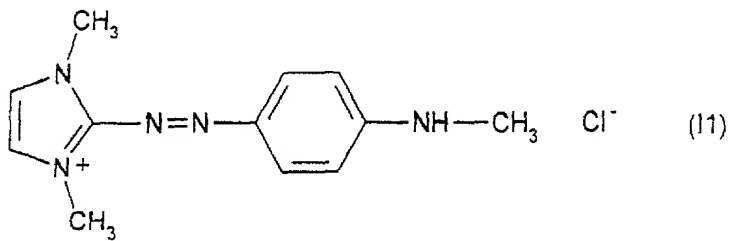


in which

R⁶ is an aliphatic radical comprising 16 to 30 carbon atoms,

R⁷, R⁸, R⁹, R¹⁰ and R¹¹ are chosen from hydrogen or an alkyl radical comprising 1 to 4 carbon atoms, and X⁻ is an anion chosen from halides, acetates, phosphates and sulphates.

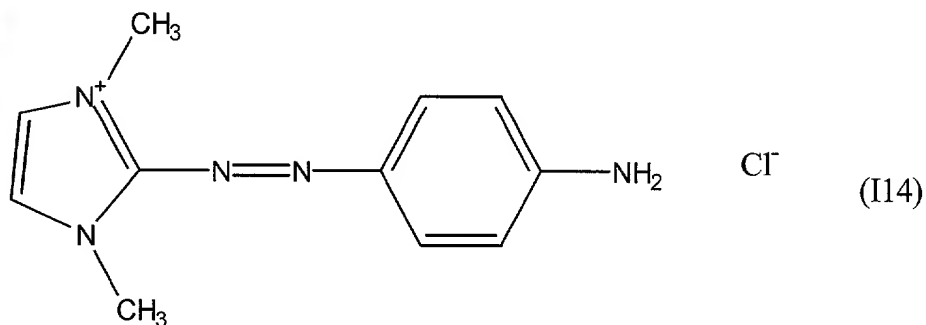
75. A composition for dyeing keratinous fibers, comprising a cationic direct dye
of structure (I1):



and oleocetyldimethylhydroxyethylammonium chloride.

76. A composition for dyeing keratinous fibers, comprising:

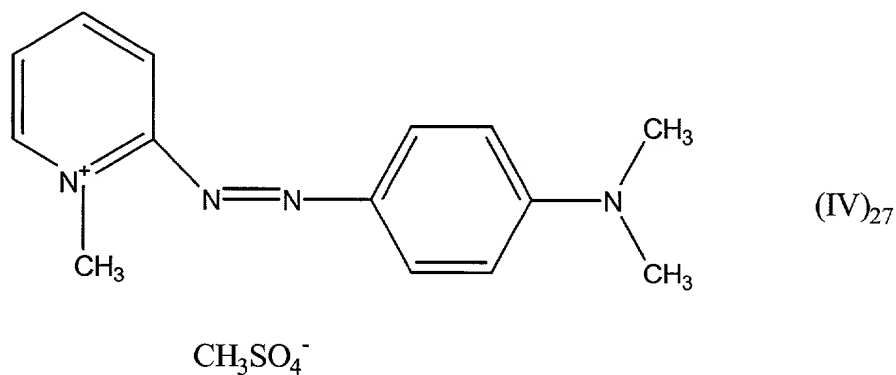
a cationic direct dye of structure (I14):



and behenyltrimethylammonium chloride.

77. A composition for dyeing keratinous fibers, comprising:

a cationic direct dye of structure (IV)₂₇:



and cetyltrimethylammonium chloride.--

REMARKS

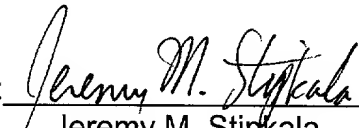
Several minor errors have been corrected in the specification. A typographical error was corrected on page 3 to clarify the subject matter of the present invention. Support can be found generally in the specification and claims as originally filed. Particular support is found on page 3, lines 17-24. On page 48, the name of a compound was corrected. Support for this amendment is found on page 50, line 3. On page 49, in formula VII, an obvious typographical error was corrected. One skilled in the art would have recognized the error, and its correction would have been readily apparent.

Claims 1 and 9-31 were canceled and claims 32-77 were added. Minor amendments were made to claims 2-8. Support for these amendments and new claims can be found in the original specification and claims. Care has been taken so that no new matter has been added. Applicants now await an action on the merits.

Please grant any extensions and charge any additional required fees to our deposit account 06-0916 if necessary.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

By: 
Jeremy M. Stipkala
Reg. No. 44,359

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422 Rec'd PCT/PTO 19 APR 2000

1

COMPOSITION FOR DYEING KERATINOUS FIBRES WITH A
CATIONIC DIRECT DYE AND A QUATERNARY AMMONIUM SALT

The invention relates to a composition for dyeing keratinous fibres, in particular human
5 keratinous fibres such as hair, comprising, in an appropriate dyeing medium, at least one cationic direct dye of a given formula, and at least one quaternary ammonium salt.

The subject of the invention is also the
10 dyeing methods and devices using the said composition.

In the hair domain, it is possible to distinguish two types of dyeing.

The first is the semipermanent or temporary dyeing, or direct dyeing, which involves dyes capable
15 of bringing the natural colour of the hair a more or less marked colour modification which is resistant, where appropriate, to several shampoos. These dyes are called direct dyes; they can be used with or without oxidizing agent. In the presence of oxidizing
20 agent, the aim is to obtain a lightening dyeing.

Lightening dyeing is performed by applying to the hair the fresh mixture of a direct dye and of an oxidizing agent and makes it possible in particular to obtain, by lightening of the melanin of the hair, an advantageous
25 effect such as a uniform colour in the case of grey hair or to make the colour stand out in the case of naturally pigmented hair.

The second is permanent dyeing or oxidation dyeing. The latter is performed with so-called "oxidation" dyes comprising oxidation dye precursors and couplers. The oxidation dye precursors, commonly
5 called "oxidation bases" are compounds which are initially colourless or faintly coloured which develop their dyeing power inside the hair in the presence of oxidizing agents added at the time of use, leading to the formation of coloured and dyeing compounds. The
10 formation of these coloured and dyeing compounds results either from an oxidative condensation of the "oxidation bases" with themselves, or an oxidative condensation of the "oxidation bases" with colour modifying compounds commonly called "couplers" and
15 generally present in the dyeing compositions used in oxidation dyeing.

To vary the shades obtained with the said oxidation dyes, or to increase their shimmer, direct dyes are sometimes added to them.

20 Among the cationic direct dyes available in the field of dyeing of keratinous fibres, especially human keratinous fibres, compounds are already known whose structure is developed in the text which follows; nevertheless, these dyes lead to colours which exhibit
25 characteristics which are still inadequate from the point of view of the intensity and homogeneity of the colour distributed along the fibre; it is said, in this case, that the colour is too selective, and from the

point of view of fastness, in terms of resistance to various attacks to which the hair may be subjected (light, adverse weather conditions, shampoos).

However, after major research studies carried out on this question, the applicant has just now discovered that it is possible to obtain novel compositions for dyeing keratinous fibres which are capable of giving intense and only slightly selective colours which are quite resistant nevertheless to the various attacks to which the hair may be subjected, by combining at least one particular anionic surfactant with at least one cationic direct dye known in the prior art and which have the respective formulae defined hereinafter.

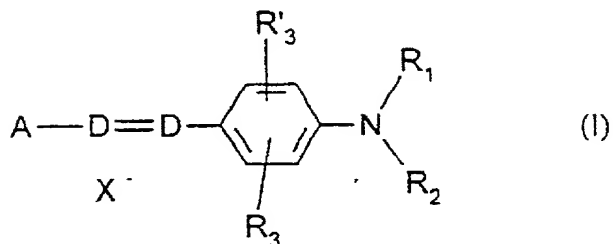
15 This discovery forms the basis of the present invention.

The first subject of the present invention is therefore a composition for dyeing keratinous fibres and in particular human keratinous fibres such as hair, containing in an appropriate dyeing medium, (i) at least one cationic direct dye whose structure corresponds to the formulae (I) to (IV) defined hereinafter, characterized in that it contains in addition (ii) at least one quaternary ammonium salt.

25 (i) The cationic direct dye which can be used according to the present invention is a compound chosen from those of the following formulae (I), (II), (III), (III'), (IV):

a) the compounds of the following formula

(I):



in which:

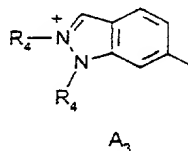
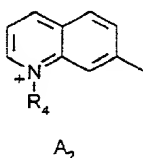
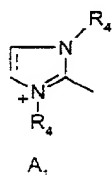
5 D represents a nitrogen atom or the -CH group,

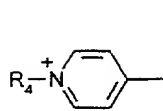
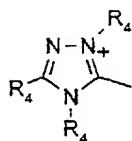
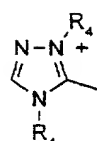
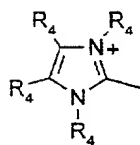
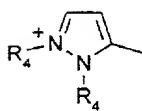
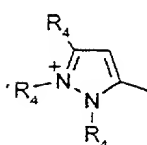
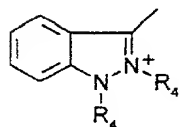
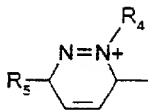
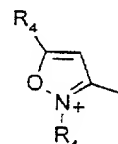
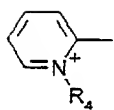
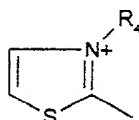
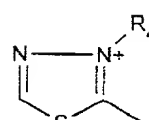
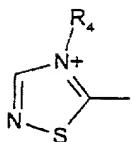
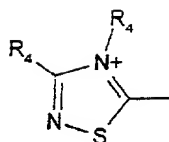
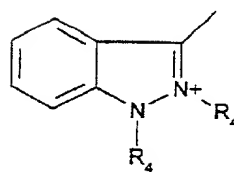
R₁ and R₂, which are identical or different, represent a hydrogen atom; a C₁-C₄ alkyl radical which may be substituted with a -CN, -OH or -NH₂ radical or
10 form with a carbon atom of the benzene ring an optionally oxygen-containing or nitrogen-containing heterocycle which may be substituted with one or more C₁-C₄ alkyl radicals; a 4'-aminophenyl radical,

R₃ and R'₃, which are identical or different,
15 represent a hydrogen or halogen atom chosen from chlorine, bromine, iodine and fluorine, a cyano, C₁-C₄ alkyl, C₁-C₄ alkoxy or acetyloxy radical,

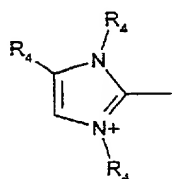
X⁻ represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

20 A represents a group chosen from the following structures A₁ to A₁₉:



A₄A₅A₆A₇A₈A₉A₁₀A₁₁A₁₂A₁₃A₁₄A₁₅A₁₆A₁₇A₁₈

and

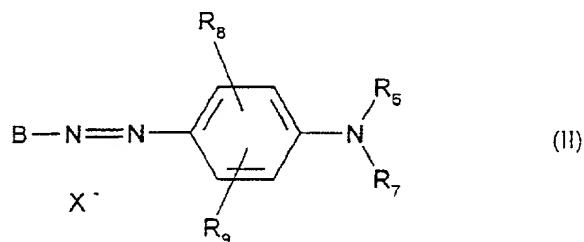
A₁₉

in which R₄ represents a C₁-C₄ alkyl radical which may
5 be substituted with a hydroxyl radical and R₅ represents

a C₁-C₄ alkoxy radical, with the proviso that when D represents -CH, A represents A₄ or A₁₃ and R₃ is different from an alkoxy radical, then R₁ and R₂ do not simultaneously denote a hydrogen atom;

5 b) the compounds of the following formula

(II):



in which:

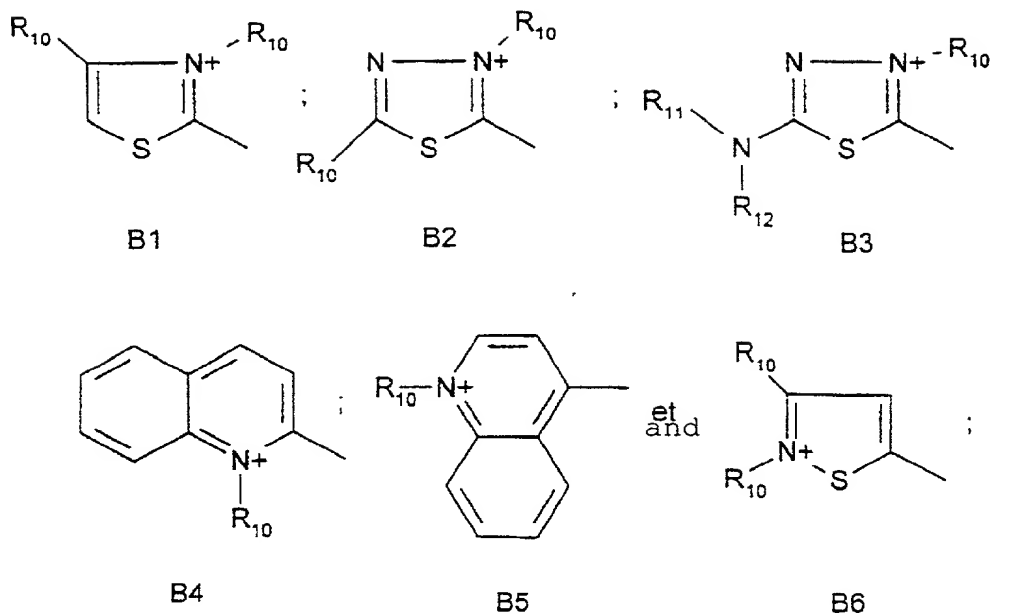
R₆ represents a hydrogen atom or a C₁-C₄ alkyl
10 radical,

R₇ represents a hydrogen atom, an alkyl radical which may be substituted with a -CN radical or with an amino group, a 4'-aminophenyl radical or forms with R₆ an optionally oxygen-containing and/or nitrogen-
15 containing heterocycle which may be substituted with a C₁-C₄ alkyl radical,

R₈ and R₉ , which are identical or different, represent a hydrogen atom, a halogen atom such as bromine, chlorine, iodine or fluorine, a C₁-C₄ alkyl or
20 C₁-C₄ alkoxy radical, a -CN radical,

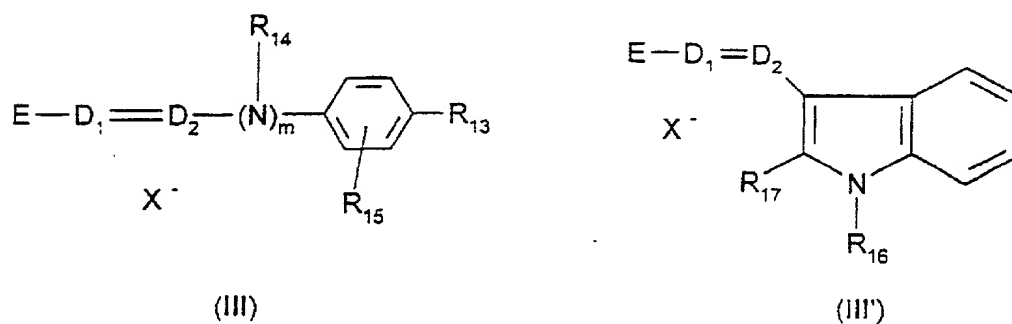
X⁻ represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

B represents a group chosen from the following structures B1 to B6:



in which R_{10} represents a C_1 - C_4 alkyl radical, R_{11} and R_{12} , which are identical or different, represent a hydrogen atom or a C_1 - C_4 alkyl radical;

- 5 c) the compounds of the following formulae (III) and (III'):



in which:

- 10 R_{13} represents a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom such as bromine, chlorine, iodine or fluorine or an amino radical,

R_{14} represents a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and/or substituted with one or more C_1 - C_4 alkyl groups,

5 R_{15} represents a hydrogen or halogen atom such as bromine, chlorine, iodine or fluorine,

R_{16} and R_{17} , which are identical or different, represent a hydrogen atom or a C_1 - C_4 alkyl radical,

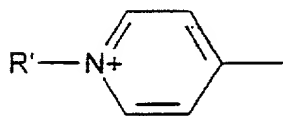
10 D_1 and D_2 , which are identical or different, represent a nitrogen atom or the $-CH$ group,

$m = 0$ or 1 ,

it being understood that when R_{13} represents an unsubstituted amino group, then D_1 and D_2 simultaneously represent a $-CH$ group and $m = 0$,

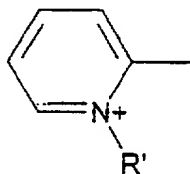
15 X^- represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

E represents a group chosen from the following structures E1 to E8:



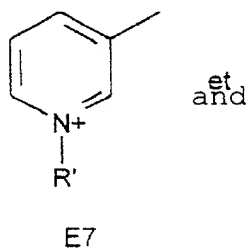
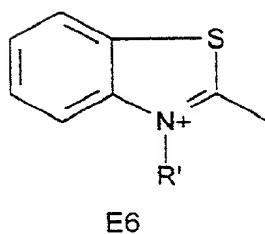
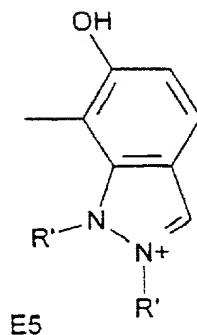
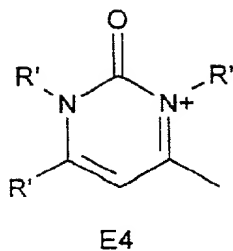
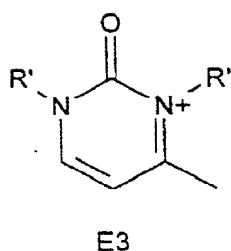
E1

;

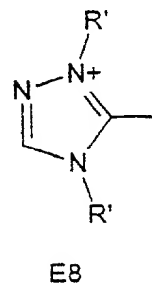


E2

;



et
and

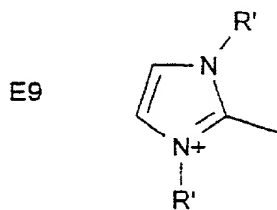


in which R' represents a C₁-C₄ alkyl radical;

when m = 0 and D₁ represents a nitrogen atom,

then E may also denote a group having the following

5 structure E9:



in which R' represents a C₁-C₄ alkyl radical,

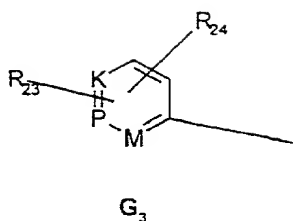
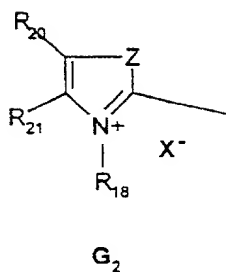
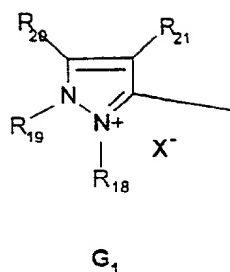
d) the compounds of the following formula

10 (IV):



in which:

the symbol G represents a group chosen from the following structures G₁ to G₃:



in which structures G_1 to G_3 ,

R_{18} denotes a C_1 - C_4 alkyl radical, a phenyl radical which
 5 may be substituted with a C_1 - C_4 alkyl radical or a
 halogen atom chosen from chlorine, bromine, iodine and
 fluorine;

R_{19} denotes a C_1 - C_4 alkyl radical or a phenyl radical;

R_{20} and R_{21} , which are identical or different, represent
 10 a C_1 - C_4 alkyl radical, a phenyl radical, or form
 together in G_1 a benzene ring which is substituted with
 one or more C_1 - C_4 alkyl, C_1 - C_4 alkoxy or NO_2 radicals, or
 form together in G_2 a benzene ring which is optionally
 substituted with one or more C_1 - C_4 alkyl, C_1 - C_4 alkoxy or
 15 NO_2 radicals;

R_{20} may denote, in addition, a hydrogen atom;

Z denotes an oxygen or sulphur atom or an $-NR_{19}$ group;

M represents a group $-CH$, $-CR$ (R denoting C_1 - C_4 alkyl),
 or $-NR_{22}(X^-)_r$;

K represents a group $-\text{CH}$, $-\text{CR}$ (R denoting $\text{C}_1\text{-C}_4$ alkyl),
or $-\text{NR}_{22}(\text{X}^-)_r$;

P represents a group $-\text{CH}$, $-\text{CR}$ (R denoting $\text{C}_1\text{-C}_4$ alkyl),
or $-\text{NR}_{22}(\text{X}^-)_r$; r denotes zero or 1;

- 5 R_{22} represents an O^- atom, a $\text{C}_1\text{-C}_4$ alkoxy radical or a
 $\text{C}_1\text{-C}_4$ alkyl radical;

R_{23} and R_{24} , which are identical or different, represent
a hydrogen or halogen atom chosen from chlorine,

bromine, iodine and fluorine, a $\text{C}_1\text{-C}_4$ alkyl radical, a

- 10 $\text{C}_1\text{-C}_4$ alkoxy radical or an $-\text{NO}_2$ radical;

X^- represents an anion which is preferably chosen from
chloride, iodide, methylsulphate, ethylsulphate,
acetate and perchlorate;

with the proviso that

- 15 if R_{22} denotes O^- , then r denotes zero;
if K or P or M denote $-\text{N}-(\text{C}_1\text{-C}_4 \text{ alkyl})\text{X}^-$, then R_{23} or R_{24}
is different from a hydrogen atom;

if K denotes $-\text{NR}_{22}(\text{X}^-)_{r'}$, then $\text{M} = \text{P} = -\text{CH}$, $-\text{CR}$;

if M denotes $-\text{NR}_{22}(\text{X}^-)_r$, then $\text{K} = \text{P} = -\text{CH}$, $-\text{CR}$;

- 20 if P denotes $-\text{NR}_{22}(\text{X}^-)_r$, then $\text{K} = \text{M}$ and denote $-\text{CH}$ or
 $-\text{CR}$;

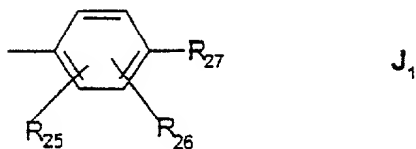
if Z denotes a sulphur atom with R_{21} denoting $\text{C}_1\text{-C}_4$
alkyl, then R_{20} is different from a hydrogen atom;

if Z denotes $-\text{NR}_{22}$ with R_{19} denoting $\text{C}_1\text{-C}_4$ alkyl, then at

- 25 least one of the R_{18} , R_{20} or R_{21} radicals of the group
having the structure G_2 is different from a $\text{C}_1\text{-C}_4$ alkyl
radical;

the symbol J represents:

-(a) a group having the following structure J_1 :



in which structure J_1 ,

- 5 R_{25} represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C_1 - C_4 alkyl radical, a C_1 - C_4 alkoxy radical, a radical $-OH$, $-NO_2$, $-NHR_{28}$, $-NR_{29}R_{30}$, $-NHCO(C_1$ - C_4 alkyl), or forms with R_{26} a 5- or 6-membered ring containing or otherwise one
10 or more heteroatoms chosen from nitrogen, oxygen or sulphur;

- R_{26} represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C_1 - C_4 alkyl or C_1 - C_4 alkoxy radical, or forms with R_{27} or R_{28} a
15 5- or 6-membered ring containing or otherwise one or more heteroatoms chosen from nitrogen, oxygen or sulphur;

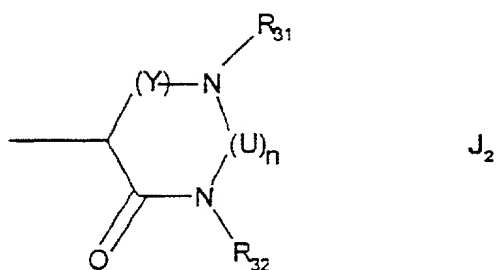
R_{27} represents a hydrogen atom, an $-OH$ radical, an $-NHR_{28}$ radical, an $-NR_{29}R_{30}$ radical;

- 20 R_{28} represents a hydrogen atom, a C_1 - C_4 alkyl radical, a C_1 - C_4 monohydroxyalkyl radical, a C_2 - C_4 polyhydroxyalkyl radical, a phenyl radical;

R_{29} and R_{30} , which are identical or different, represent a C_1 - C_4 alkyl radical, a C_1 - C_4 monohydroxyalkyl radical,

- 25 a C_2 - C_4 polyhydroxyalkyl radical;

- (b) a 5- or 6- membered nitrogen-containing heterocycle group which is capable of containing other heteroatoms and/or carbonyl-containing groups and which may be substituted with one or more C₁-C₄ alkyl, amino or phenyl radicals,
 5 and in particular a group having the following structure J₂:



in which structure J₂,
 10 R₃₁ and R₃₂, which are identical or different, represent a hydrogen atom, a C₁-C₄ alkyl radical, a phenyl radical;

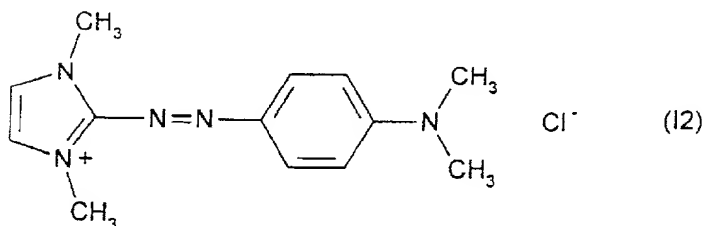
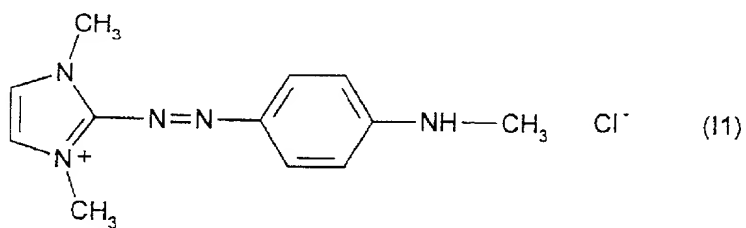
Y denotes the -CO- radical or the radical $\text{—}\overset{\text{CH}_3}{\underset{|}{\text{C}}}=\text{}$;
 n = 0 or 1, with, when n denotes 1, U denotes the -CO-
 15 radical.

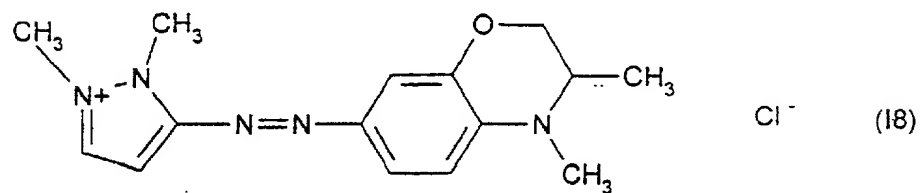
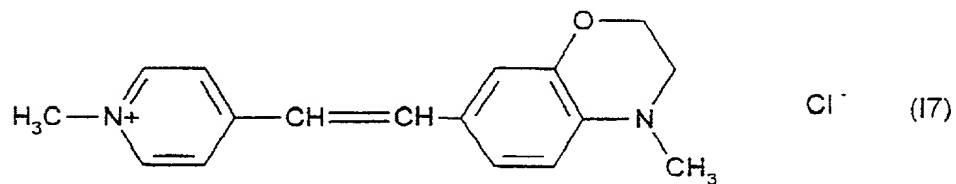
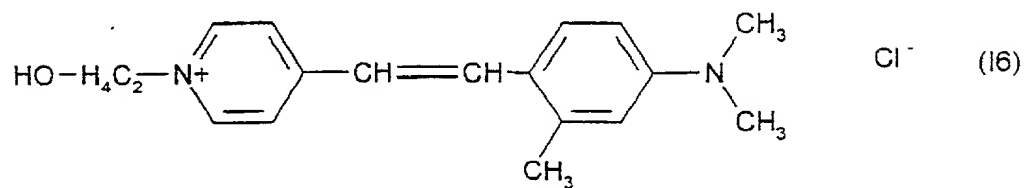
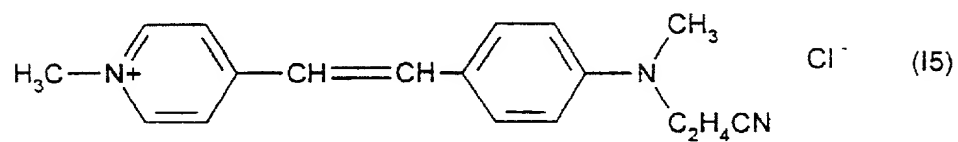
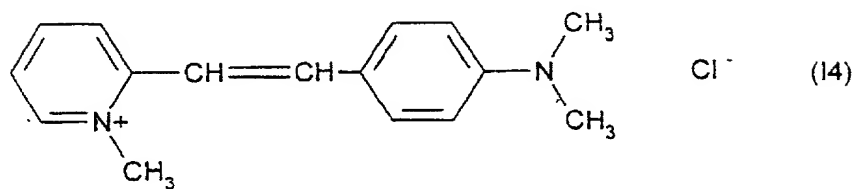
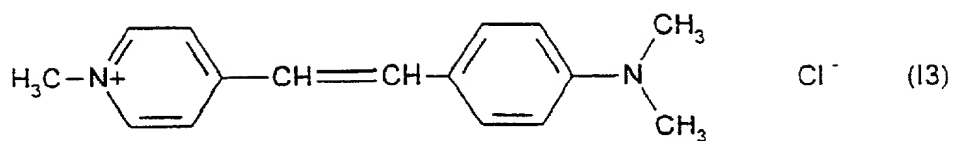
In the structures (I) to (IV) defined above, the C₁-C₄ alkyl or alkoxy group preferably denotes methyl, ethyl, butyl, methoxy or ethoxy.

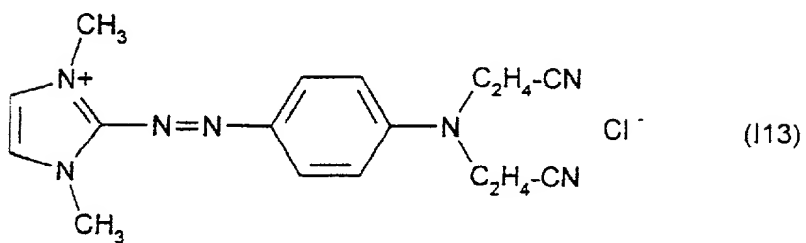
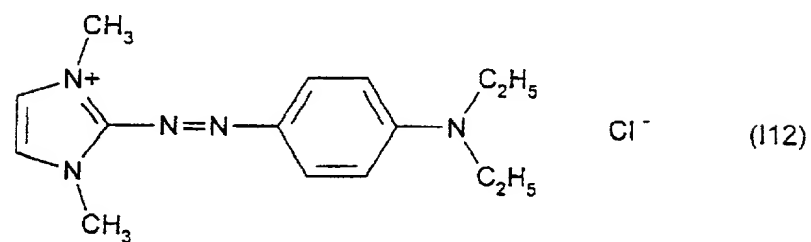
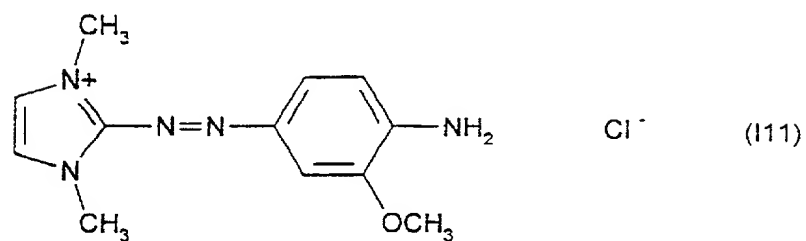
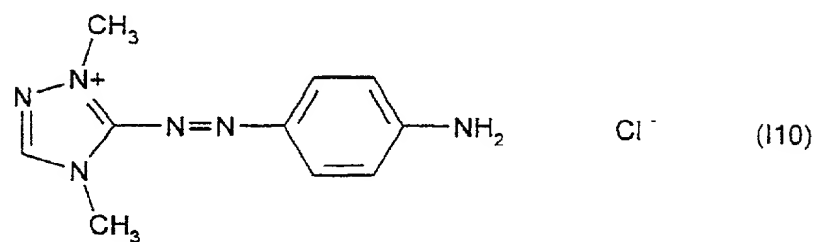
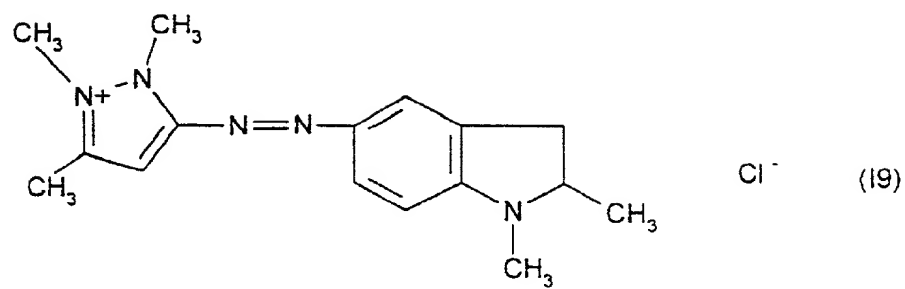
The cationic direct dyes of formulae (I),
 20 (II), (III) and (III') which can be used in the dyeing compositions in accordance with the invention are known compounds which are described, for example, in patent applications WO 95/01772, WO 95/15144 and

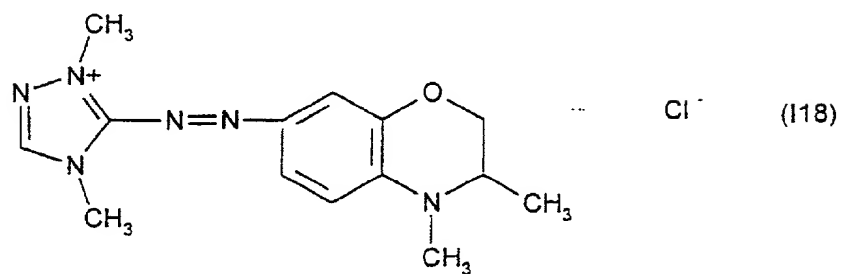
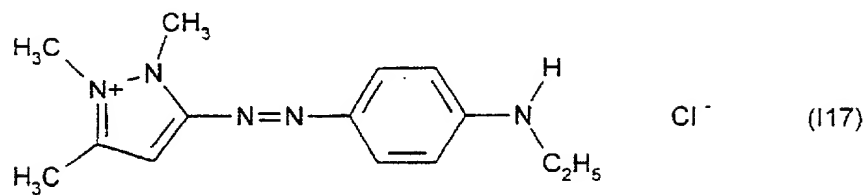
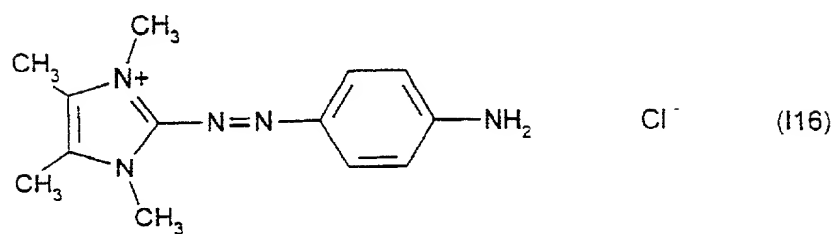
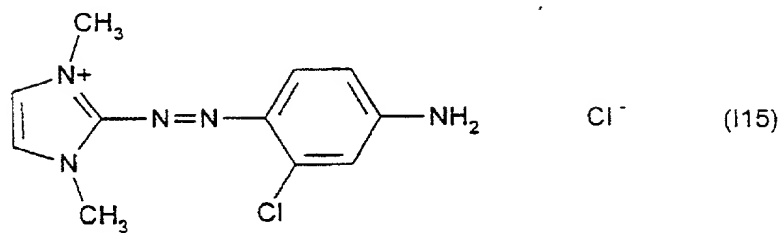
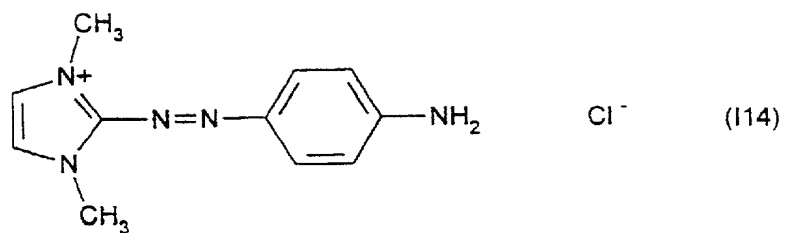
EP-A-O 714 954. Those of formula (IV) that are
 useable in the dye compositions of the invention are
 5 identified compounds described in, for example, the
 patent applications FR-2189006, FR-2285851, and FR-
 2140205 and their certificates of addition.

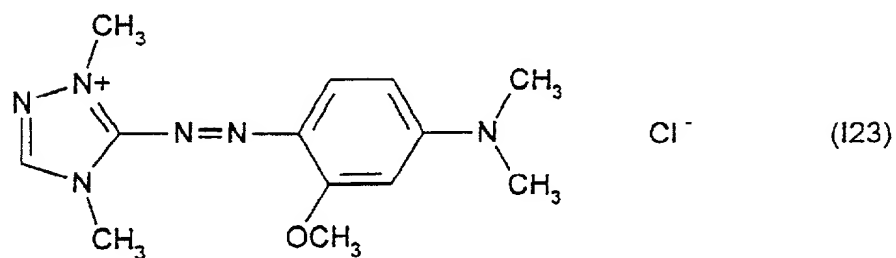
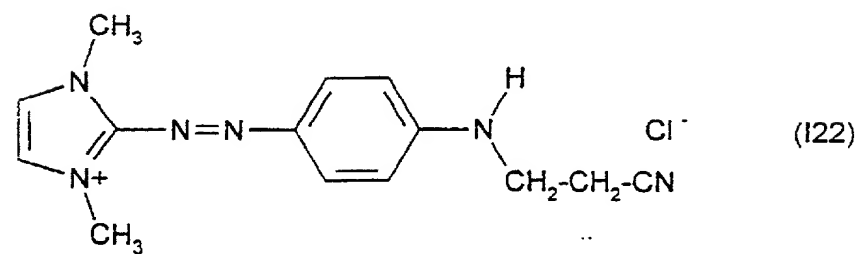
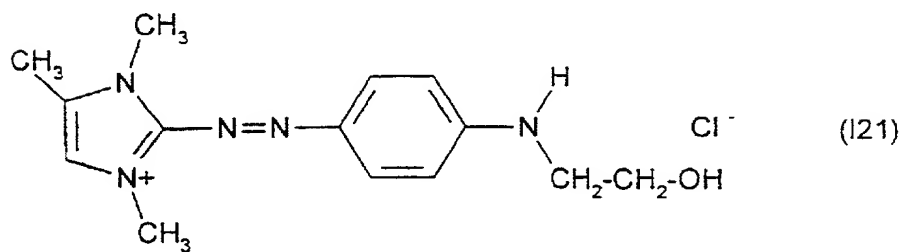
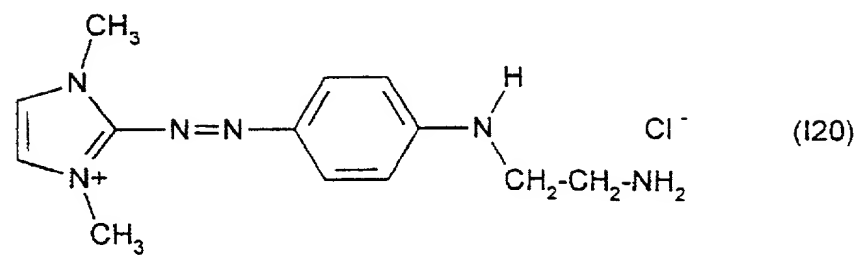
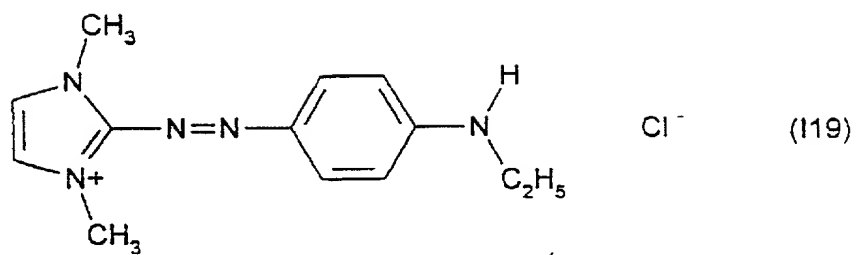
Among the direct cationic dyes of formula (I) that
 10 are useable in the dye compositions of the invention,
 the compounds based on the following structures (I1)
 to (I54) can be specifically noted.

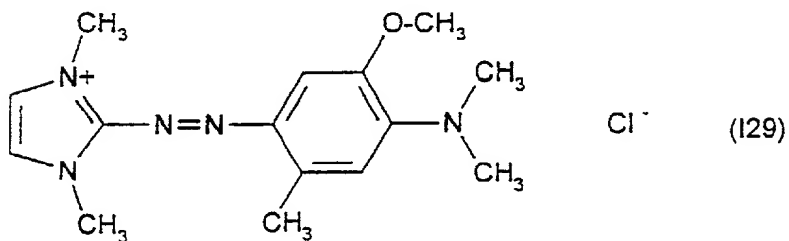
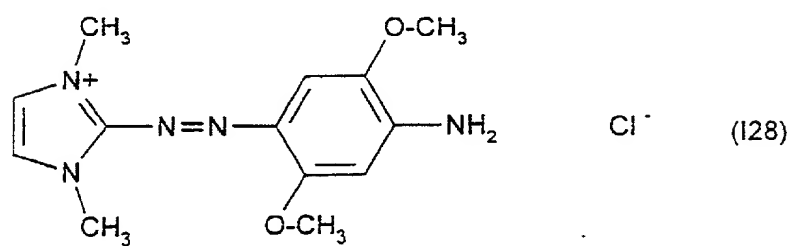
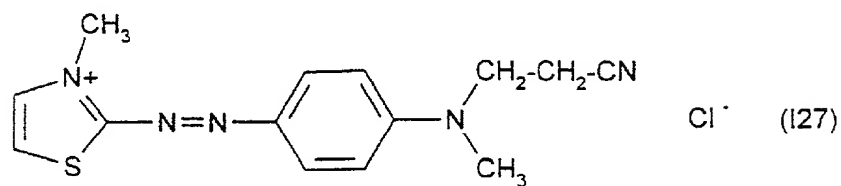
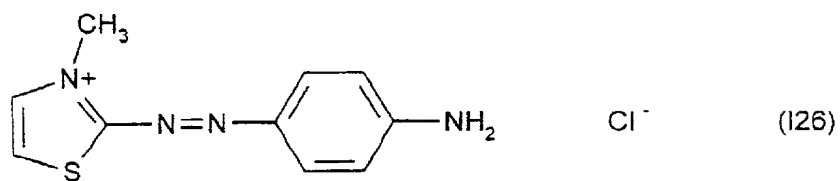
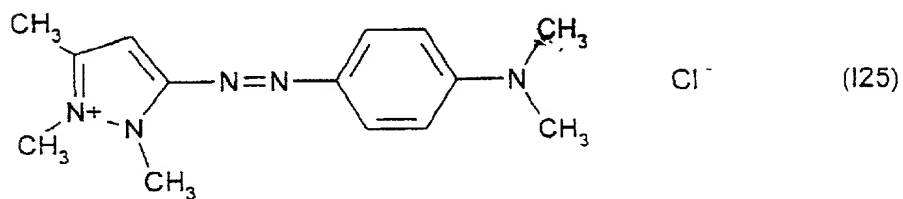
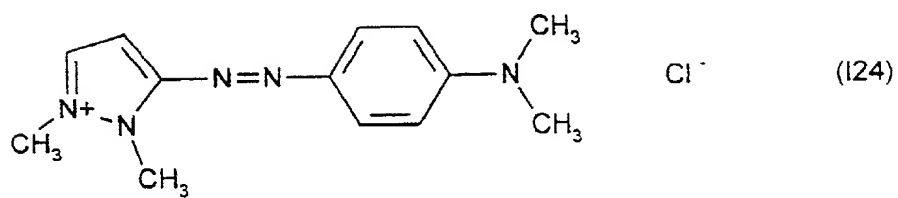


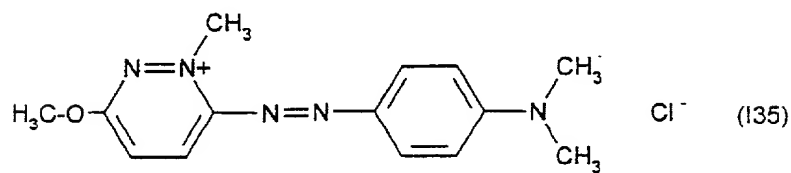
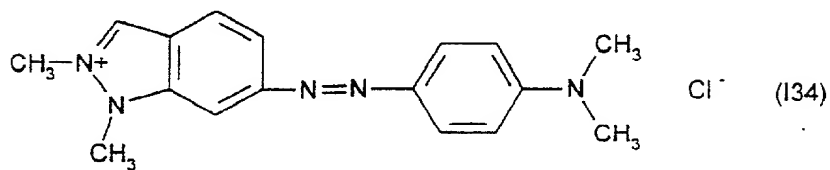
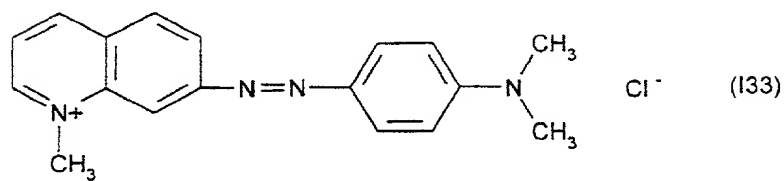
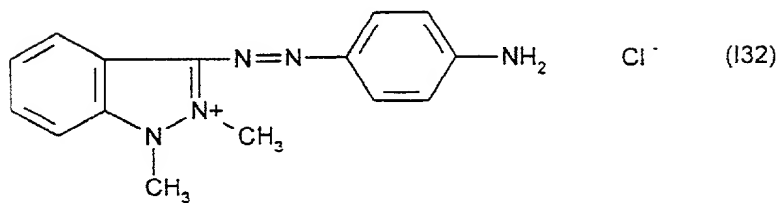
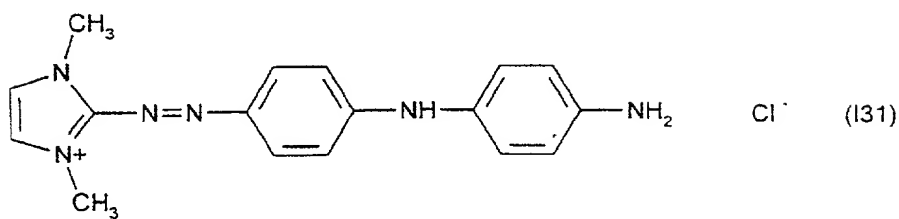
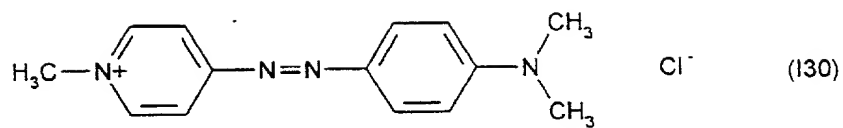


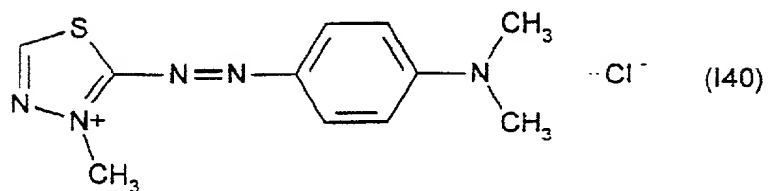
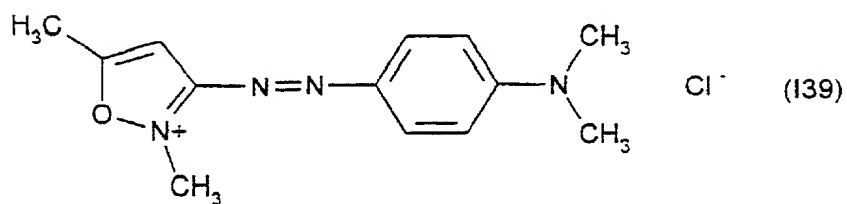
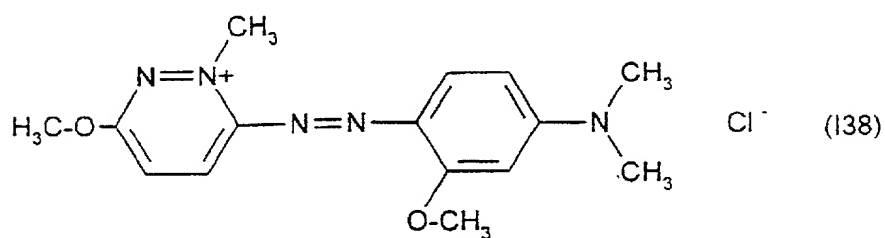
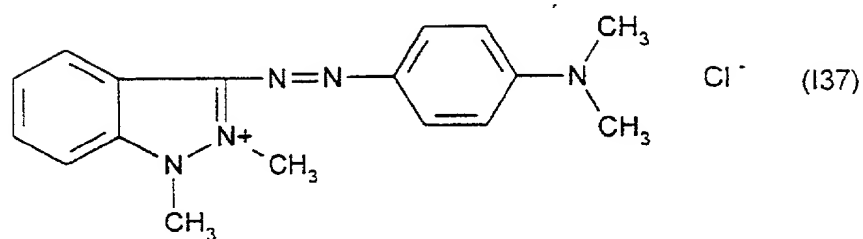
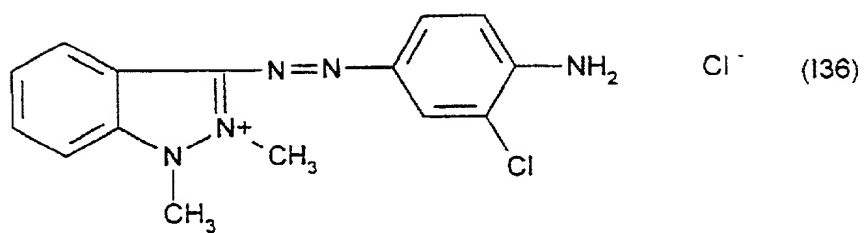


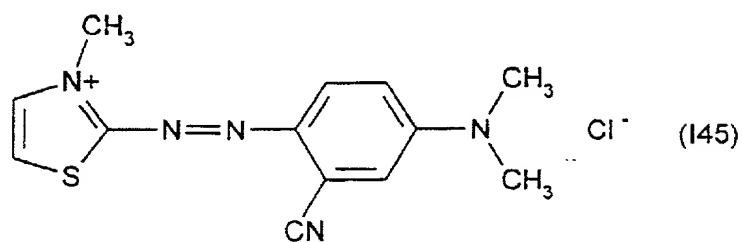
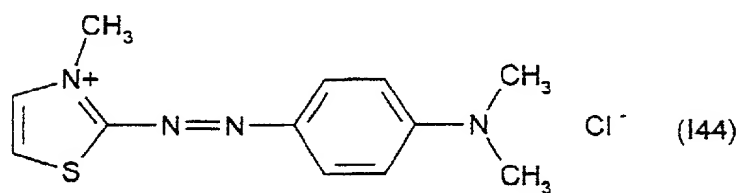
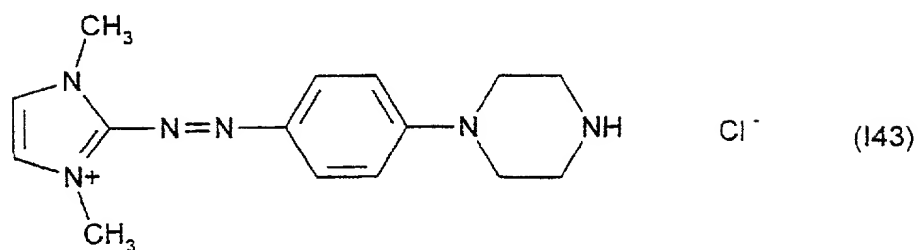
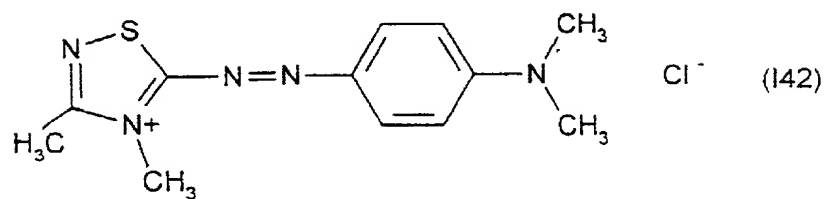
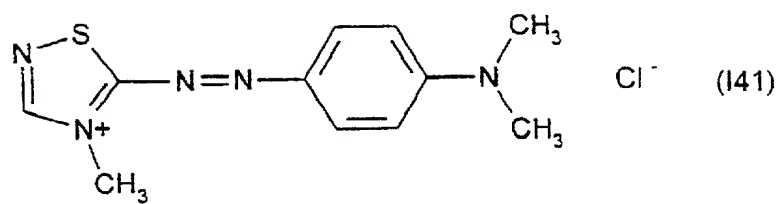


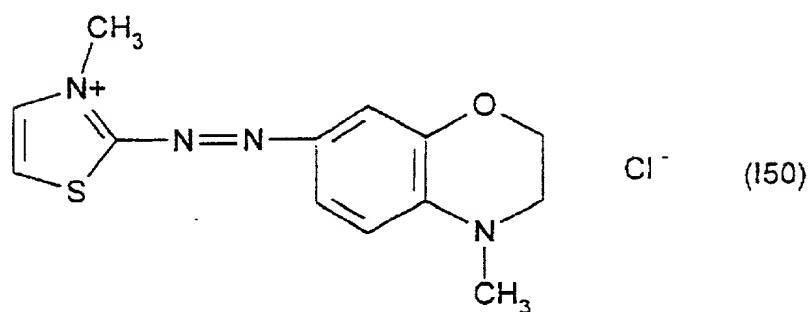
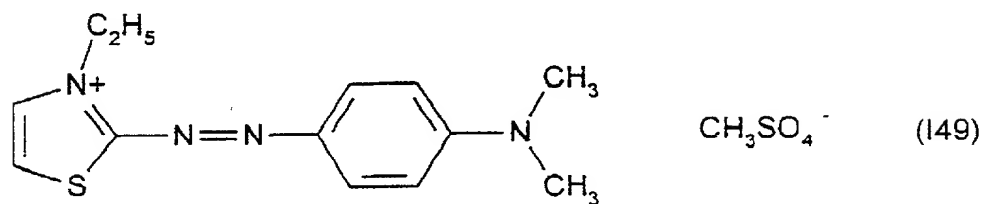
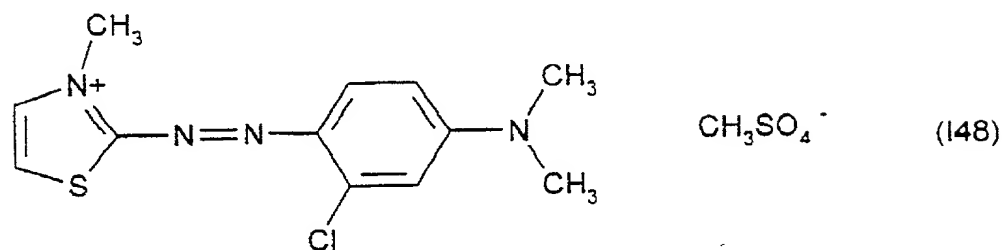
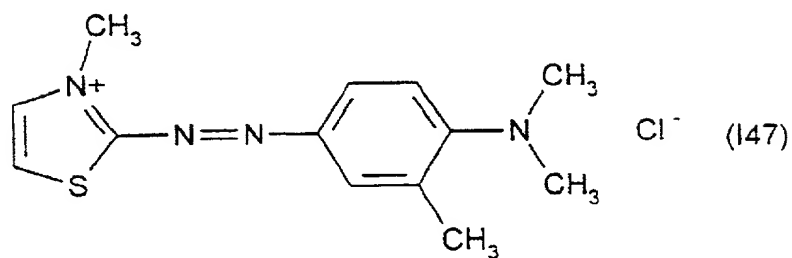
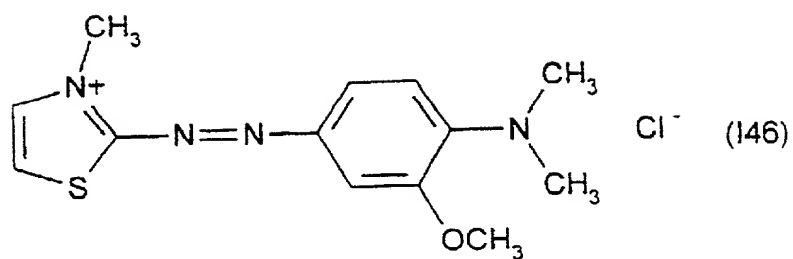


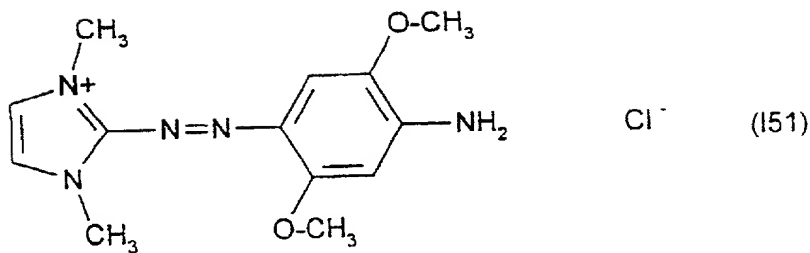




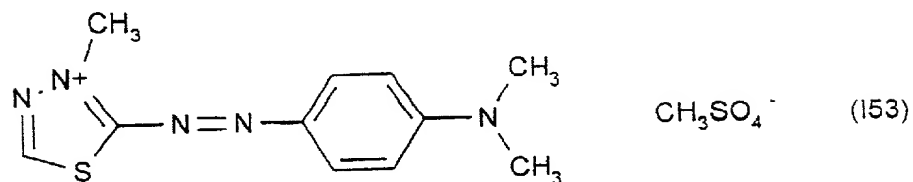
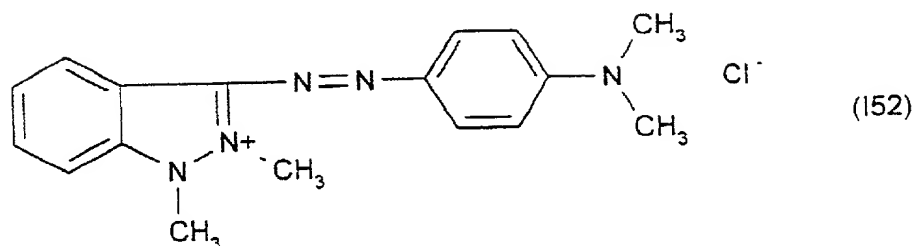




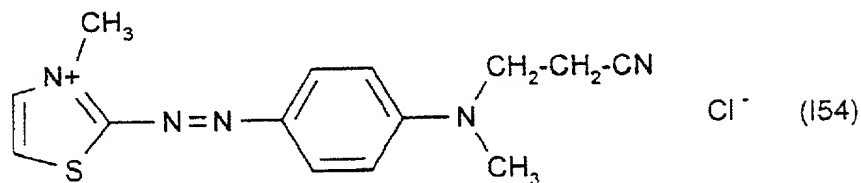




~~and~~



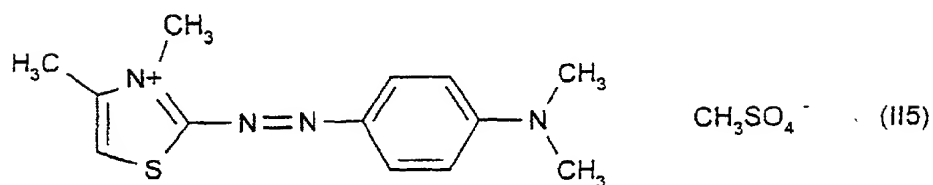
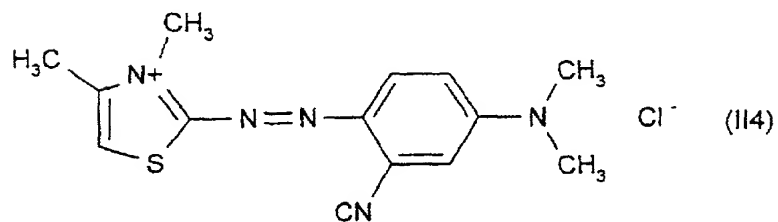
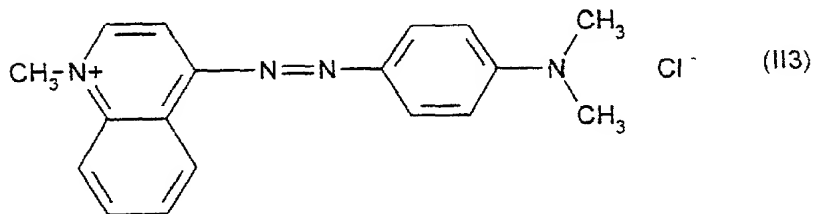
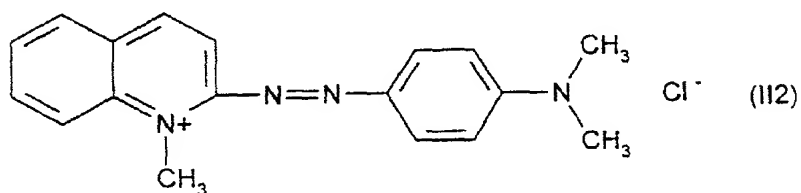
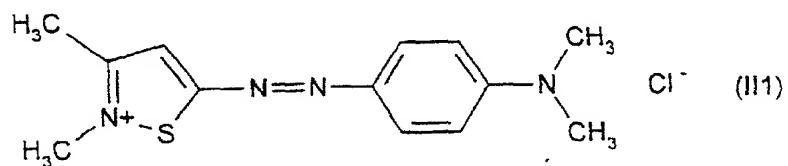
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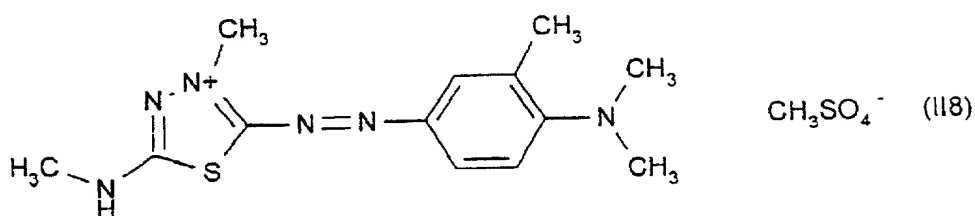
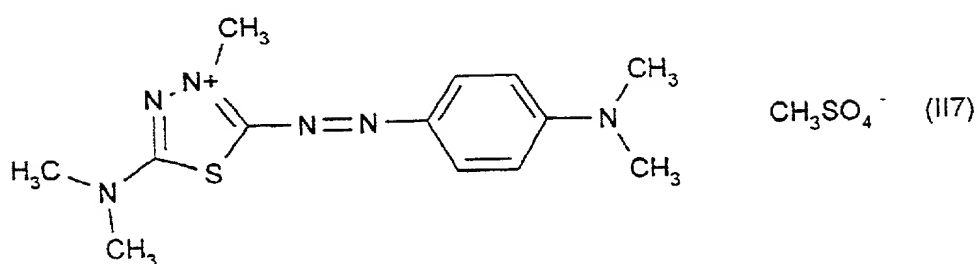
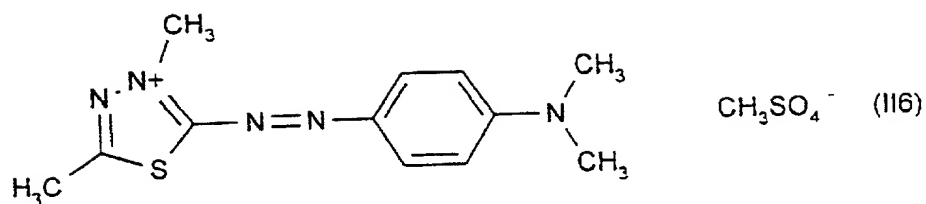


Among the compounds having the structures (I1) to (I54) which are described above, the compounds corresponding to the structures (I1), (I2), (I14) and (I31) are most particularly preferred.

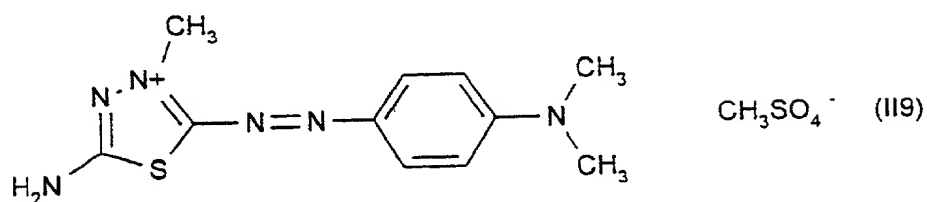
Among the cationic direct dyes of formula (II) which can be used in the dyeing compositions in accordance with the invention, there may be mentioned

more particularly the compounds corresponding to the following structures (II1) to (II9):

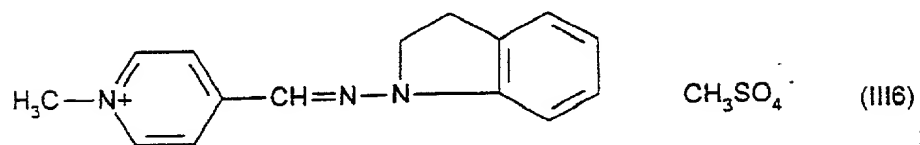
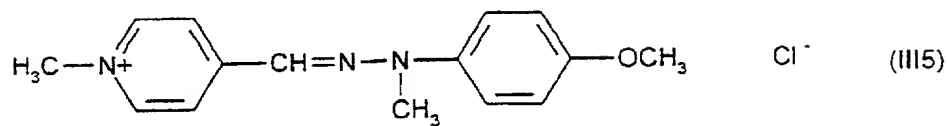
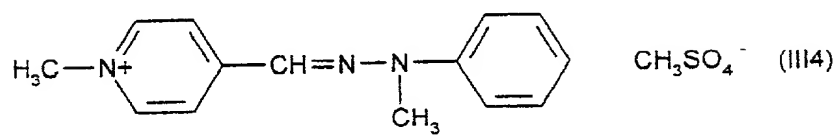
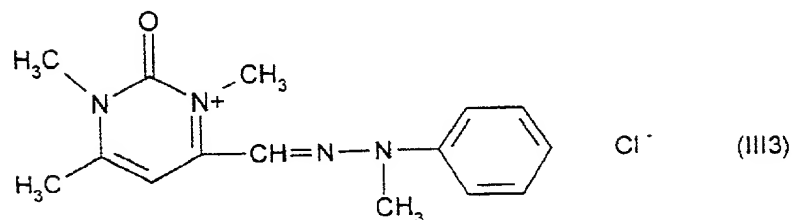
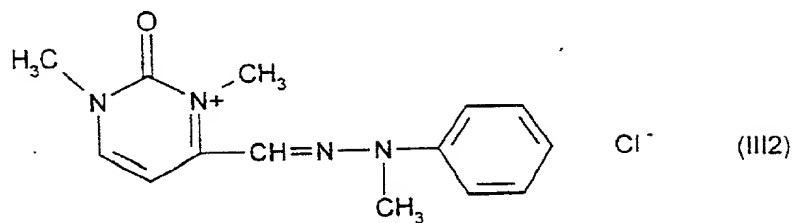
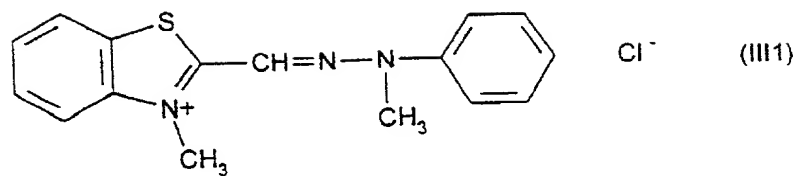


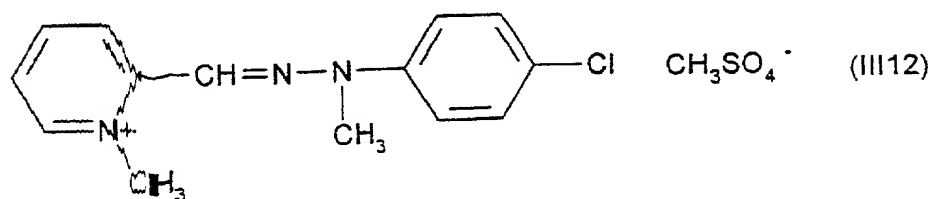
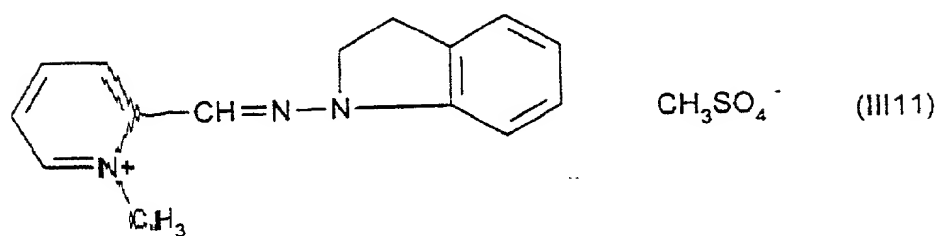
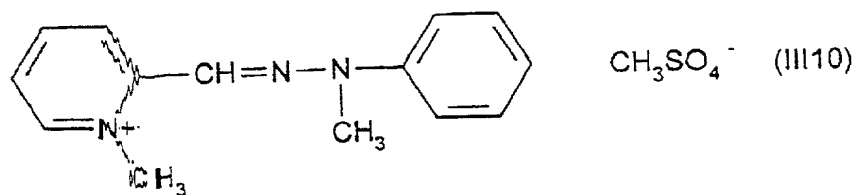
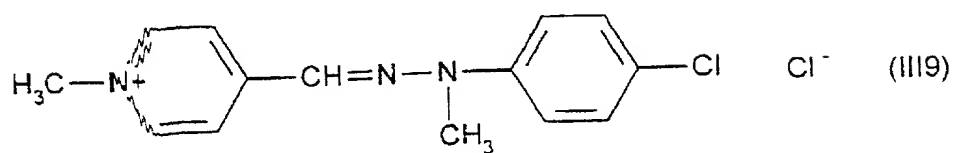
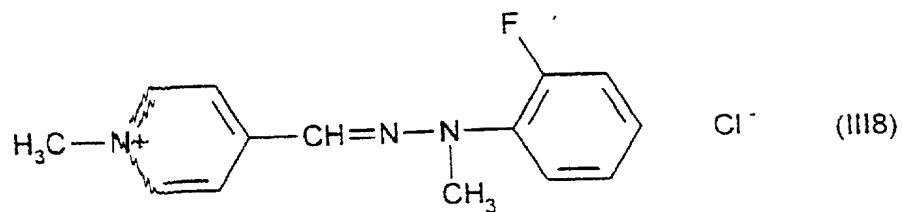
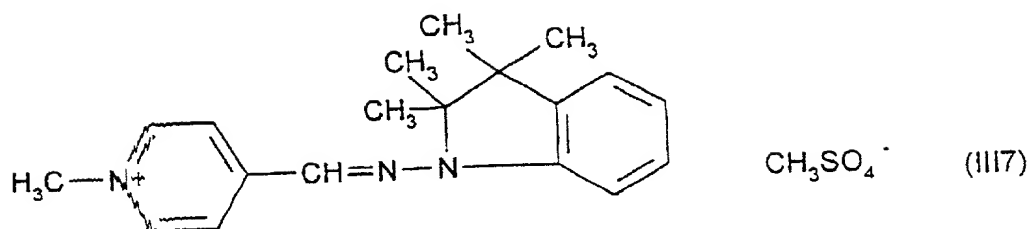


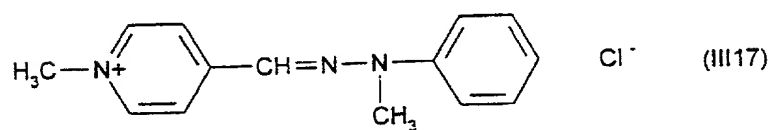
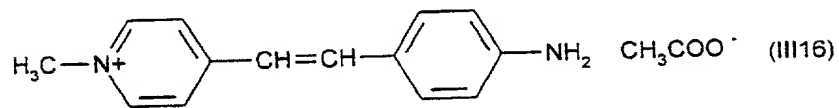
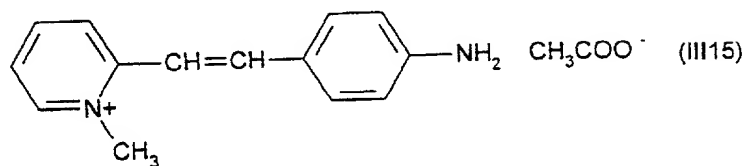
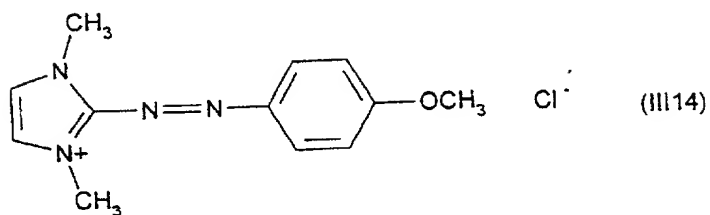
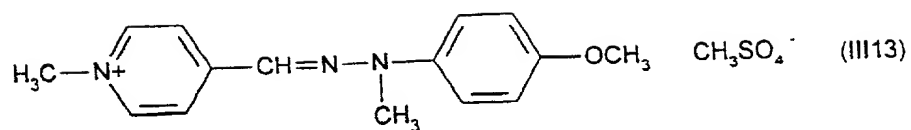
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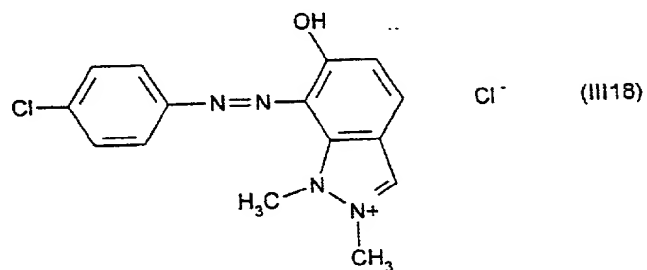
Among the cationic direct dyes of formula (III) which can be used in the dyeing compositions in accordance with the invention, there may be mentioned 5 more particularly the compounds corresponding to the following structures (III1) to (III18):







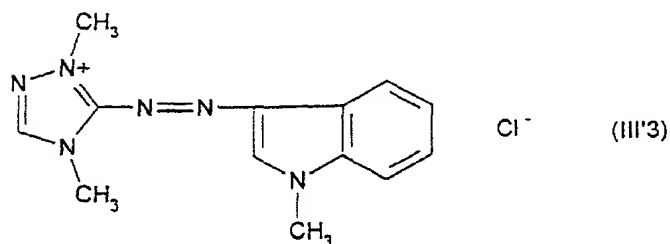
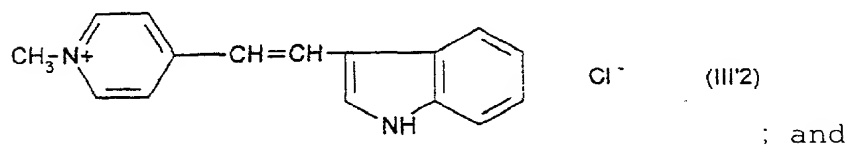
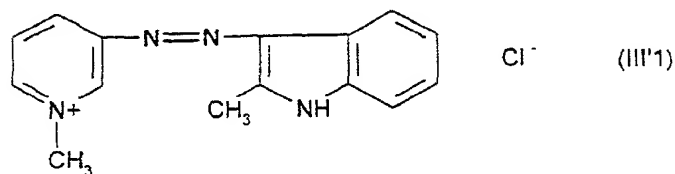
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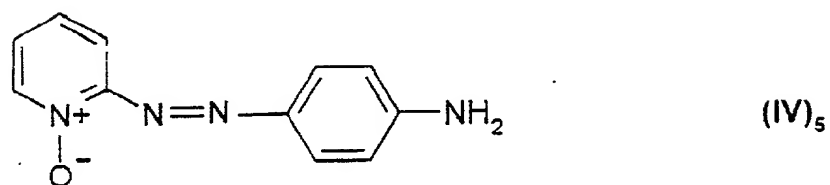
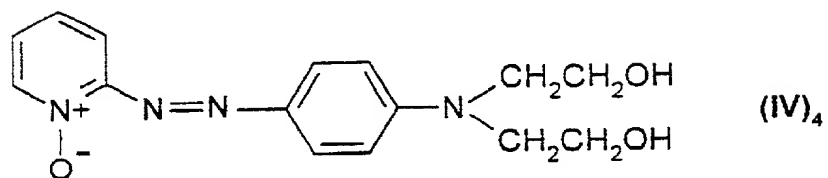
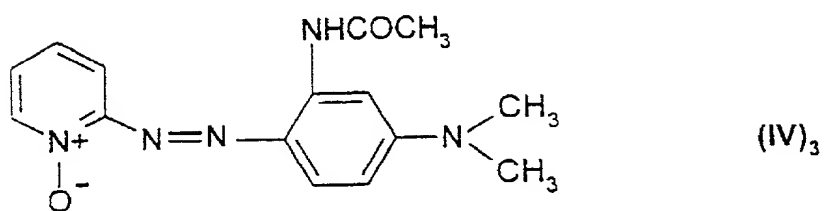
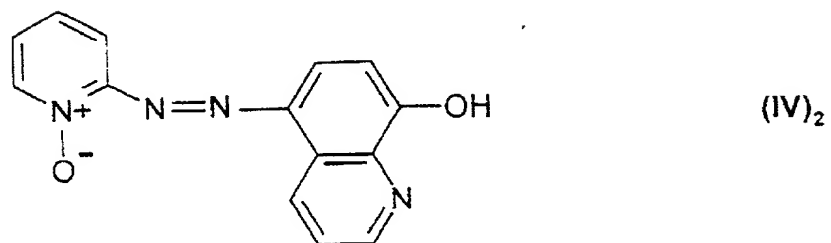
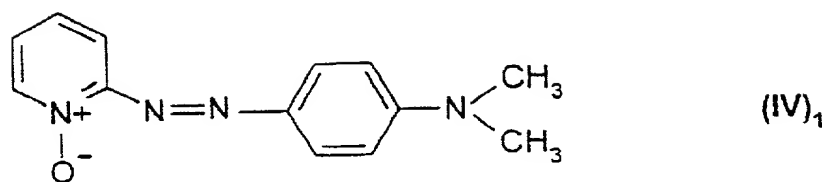
Among the particular compounds having the structures (III1) to (III18) which are described above,

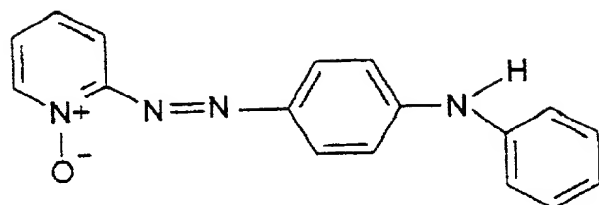
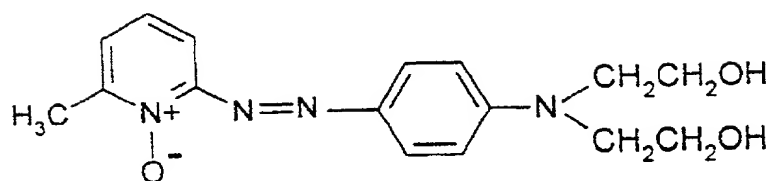
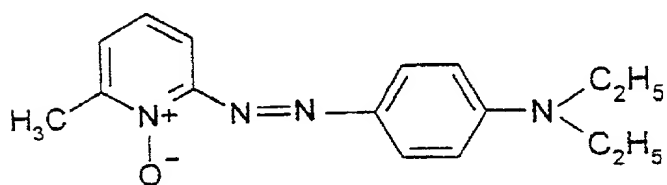
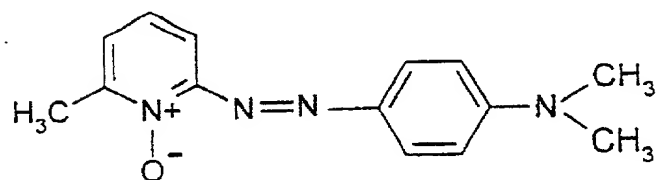
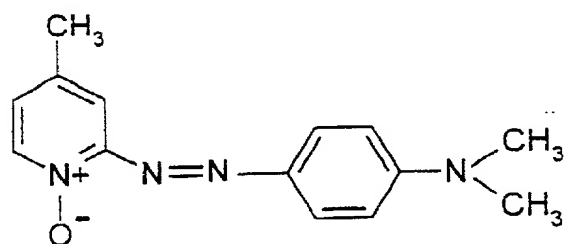
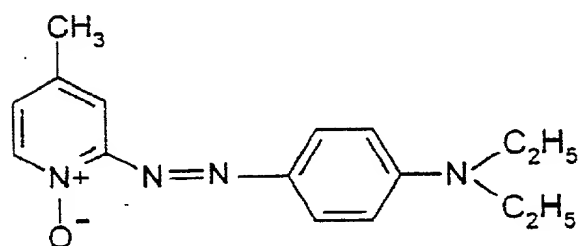
the compounds corresponding to the structures (III4), (III5) and (III13) are most particularly preferred.

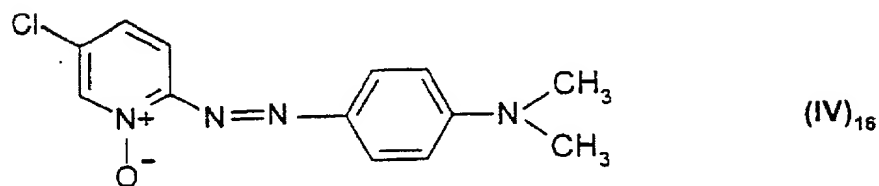
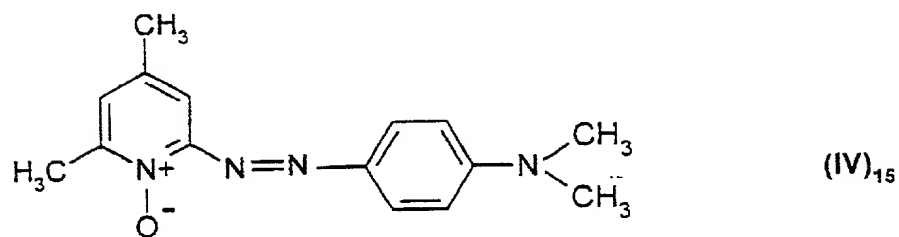
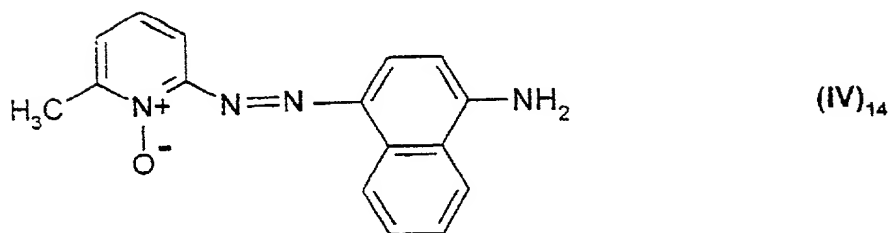
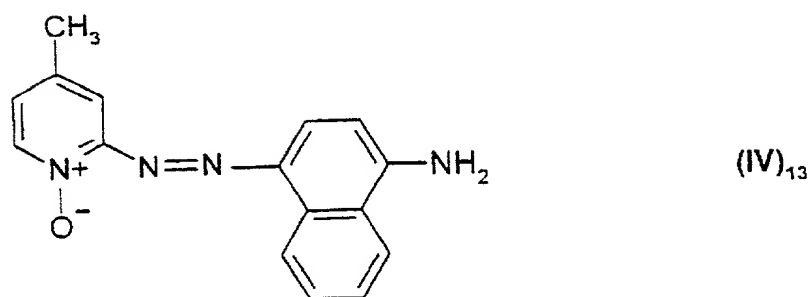
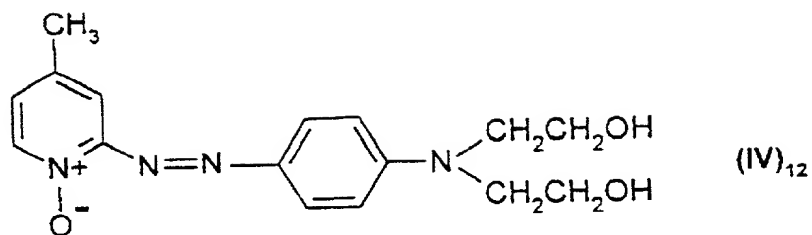
Among the cationic direct dyes of formula (III') which can be used in the dyeing compositions in accordance with the invention, there may be mentioned more particularly the compounds corresponding to the following structures (III'1) to (III'3):

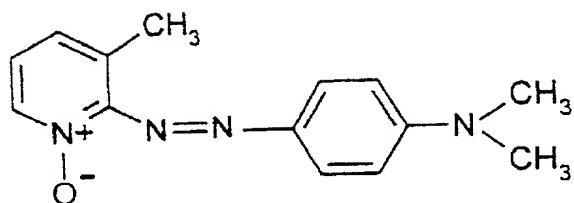
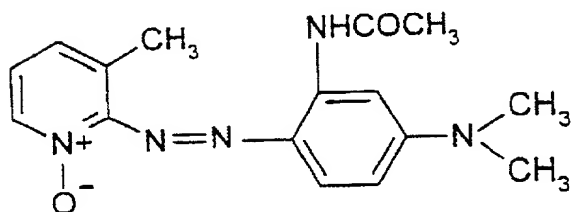
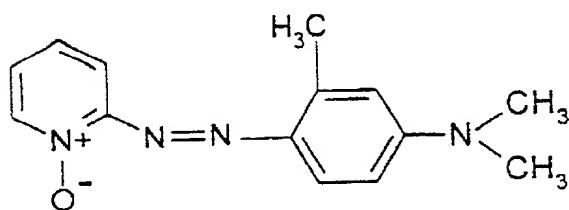
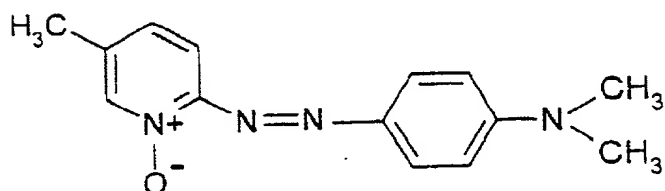
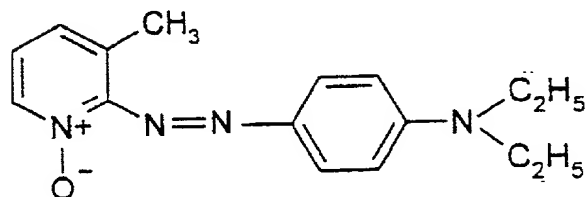
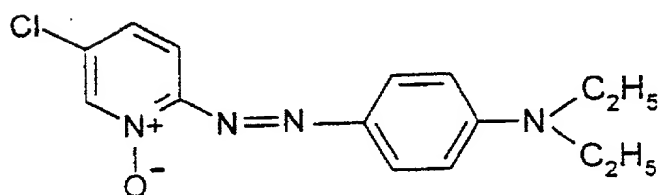


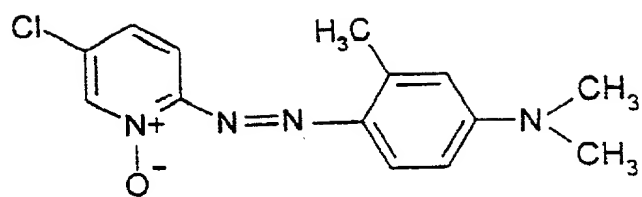
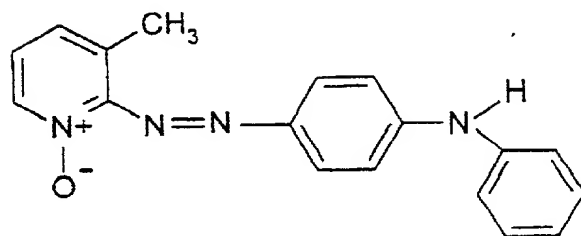
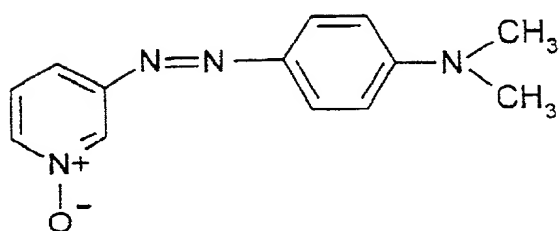
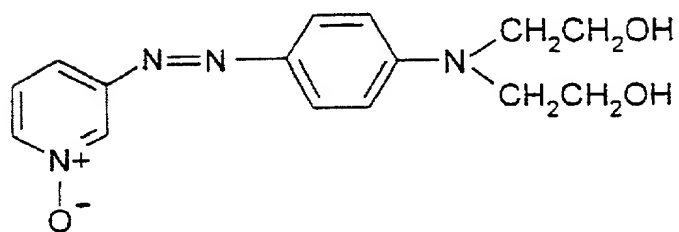
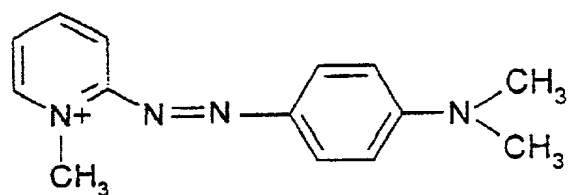
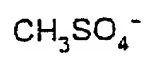
Among the cationic direct dyes of formula (IV) which can be used in the dyeing compositions in accordance with the invention, there may be mentioned more particularly the compounds having the following structures (IV)₁ to (IV)₇₇:

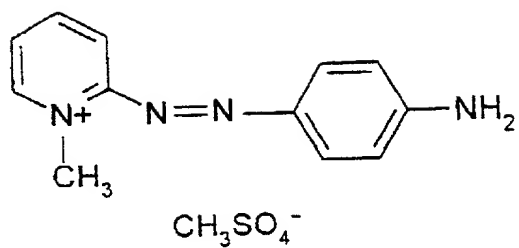
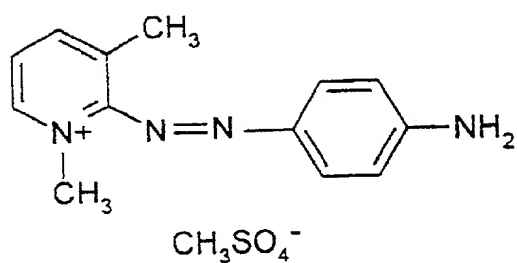
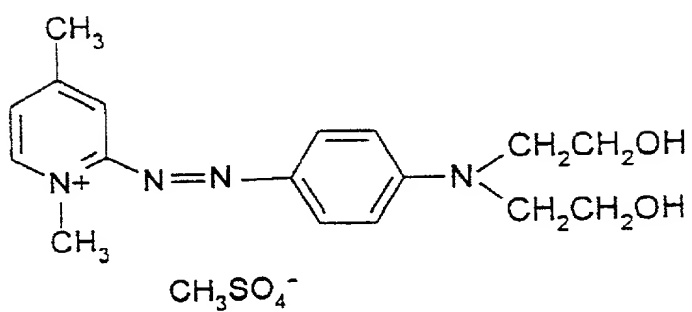
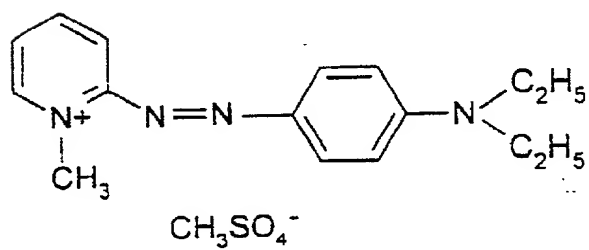
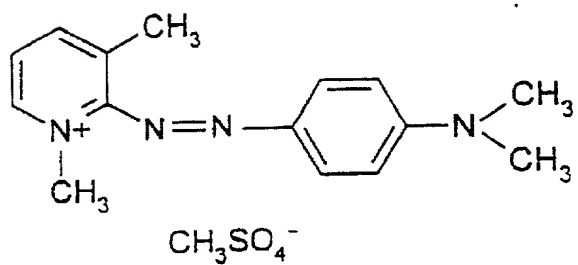


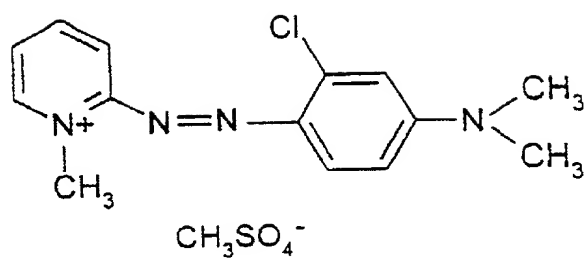
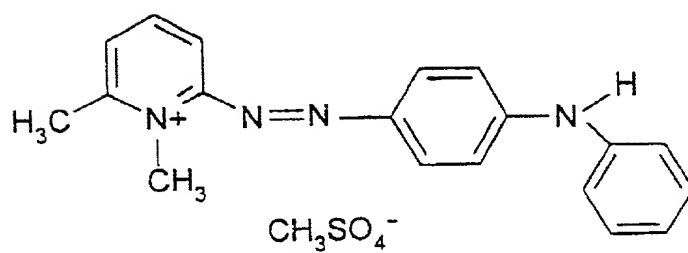
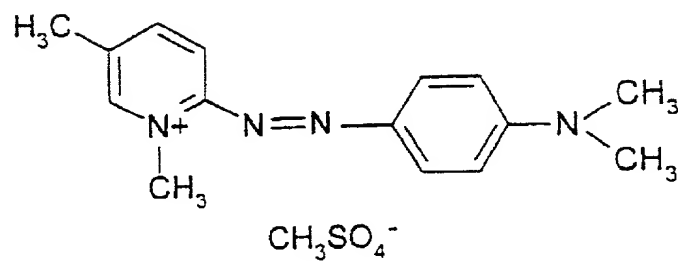
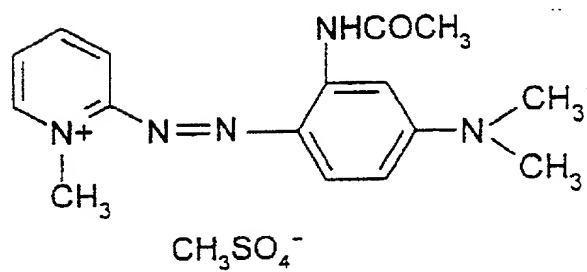
(IV)₆(IV)₇(IV)₈(IV)₉(IV)₁₀(IV)₁₁

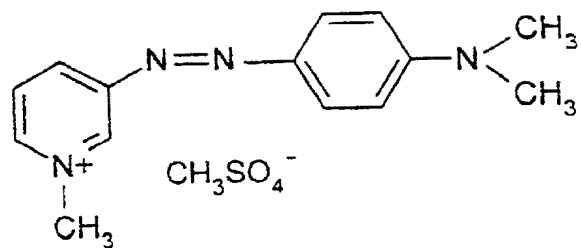
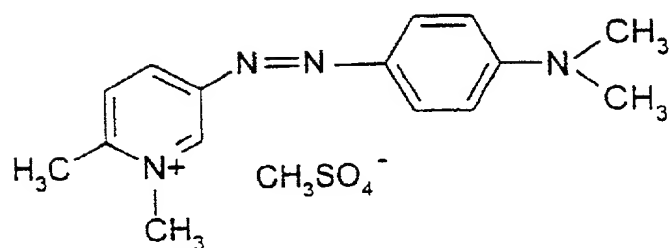
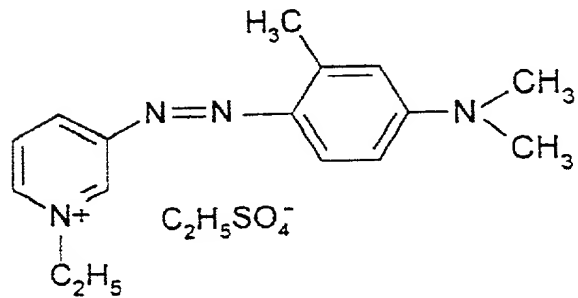
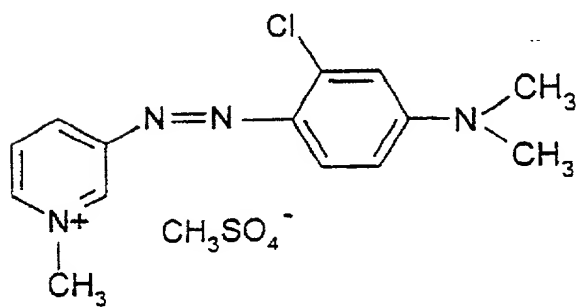


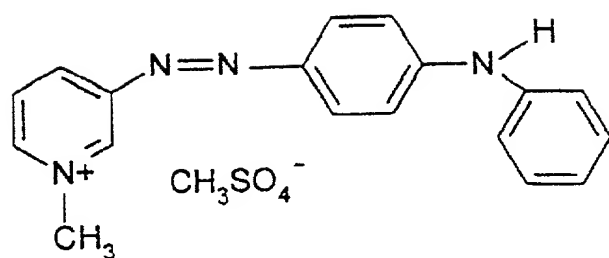
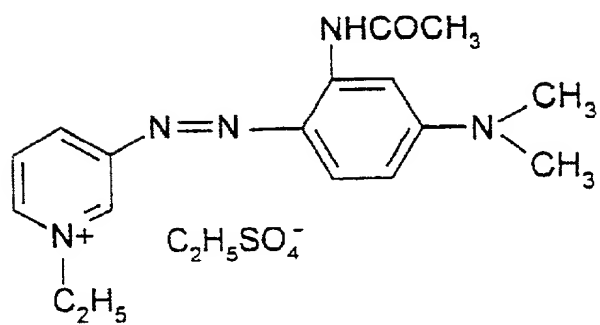
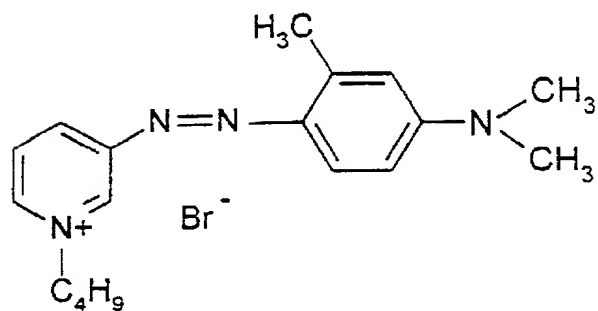
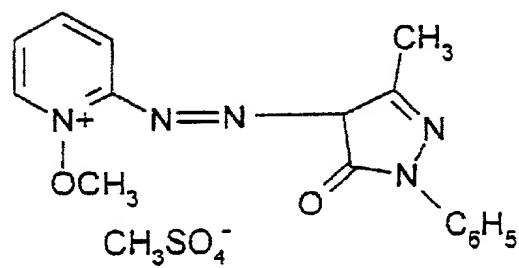
(IV)₁₇(IV)₁₈(IV)₁₉(IV)₂₀(IV)₂₁(IV)₂₂

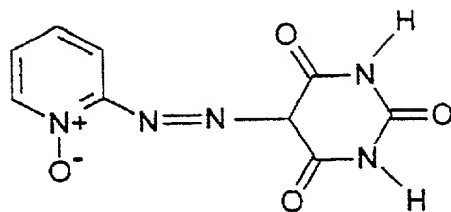
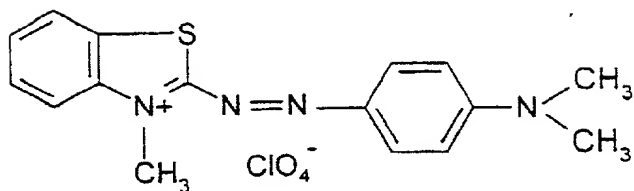
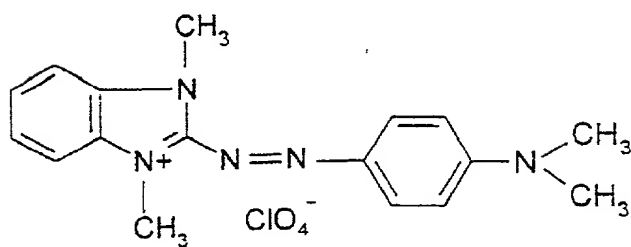
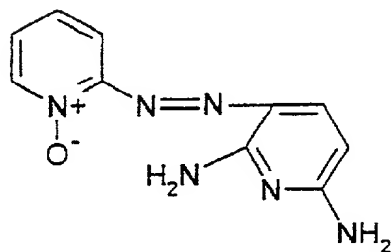
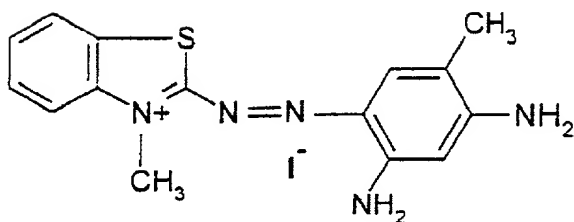
(IV)₂₃(IV)₂₄(IV)₂₅(IV)₂₆(IV)₂₇

(IV)₂₈(IV)₂₉(IV)₃₀(IV)₃₁(IV)₃₂

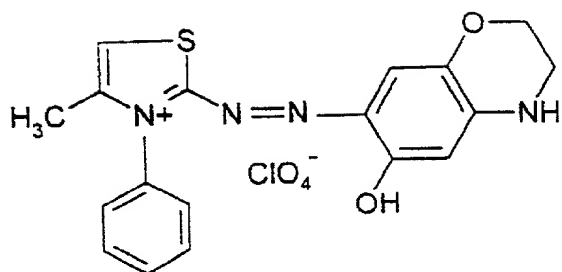
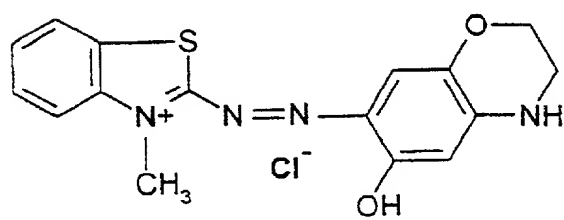
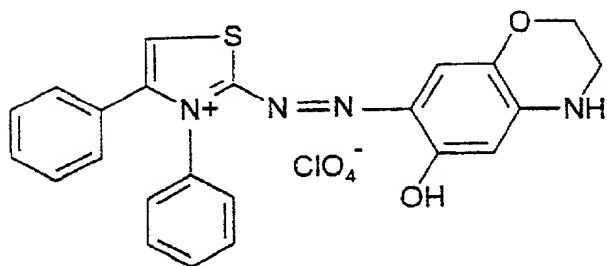
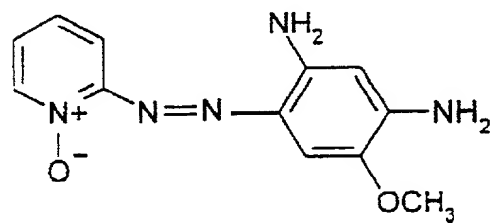
(IV)₃₃(IV)₃₄(IV)₃₅(IV)₃₆

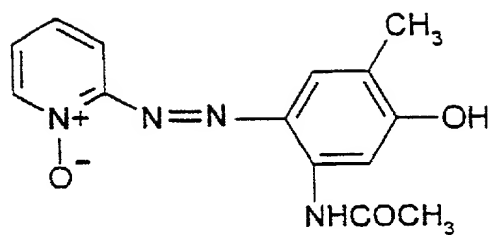
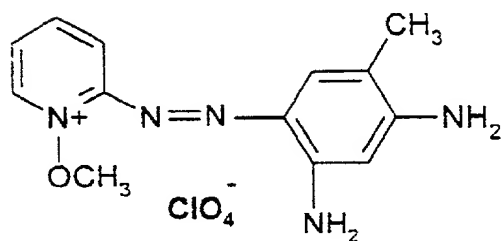
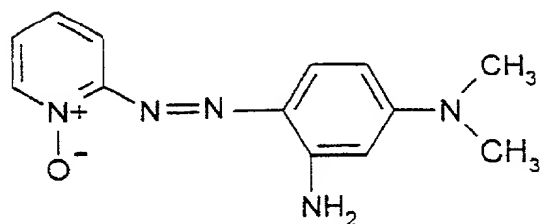
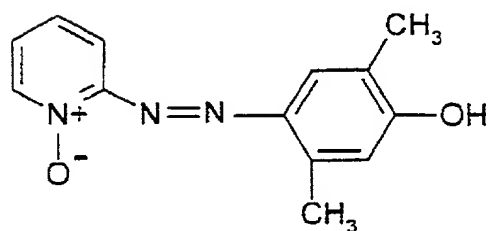
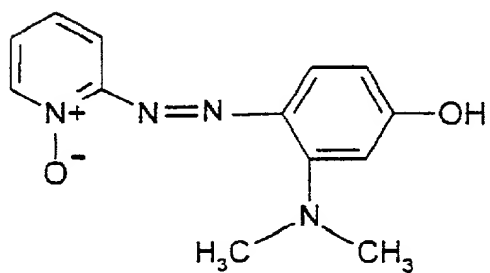
(IV)₃₇(IV)₃₈(IV)₃₉(IV)₄₀

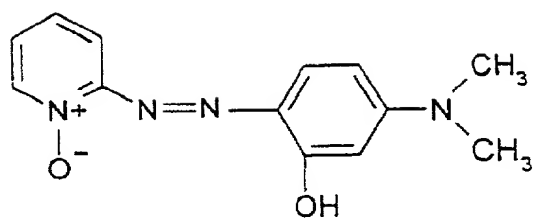
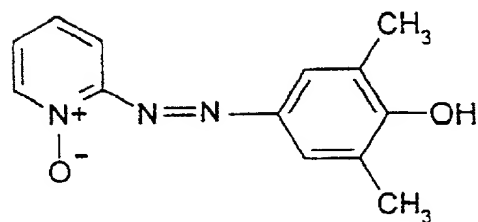
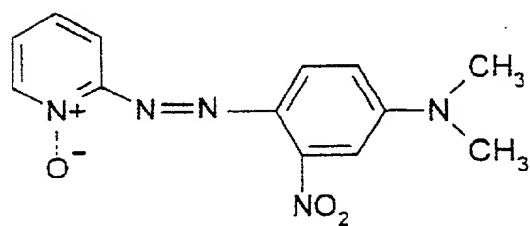
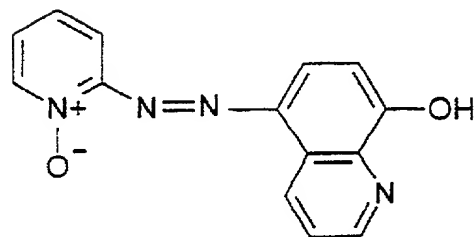
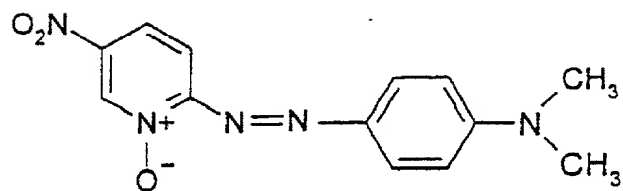
(IV)₄₁(IV)₄₂(IV)₄₃(IV)₄₄

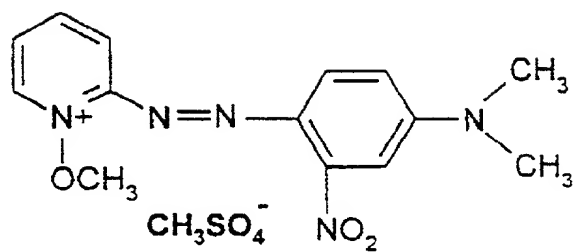
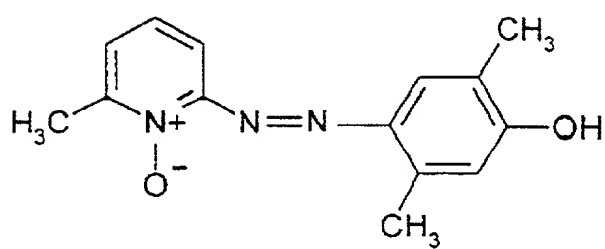
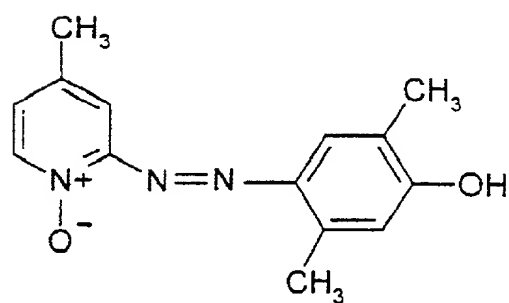
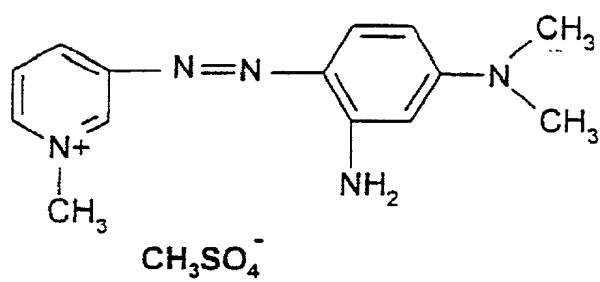
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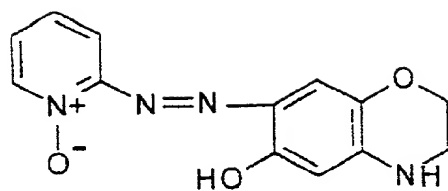
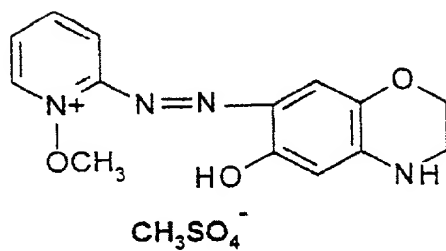
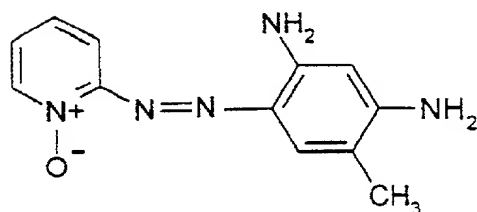
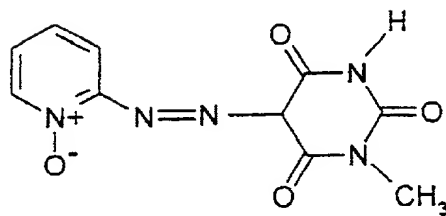
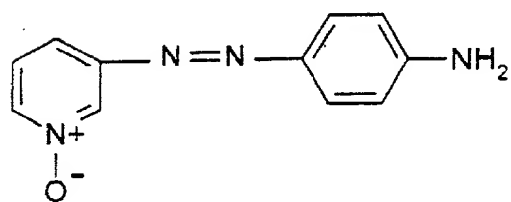
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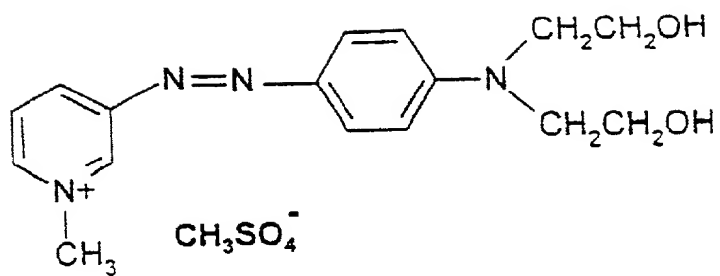
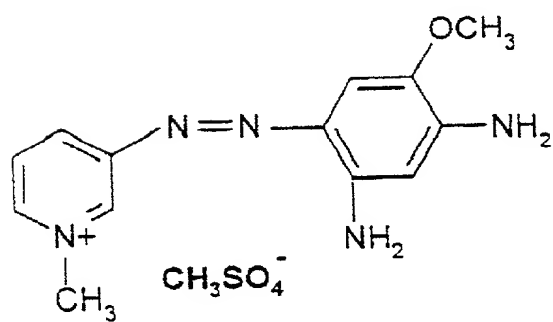
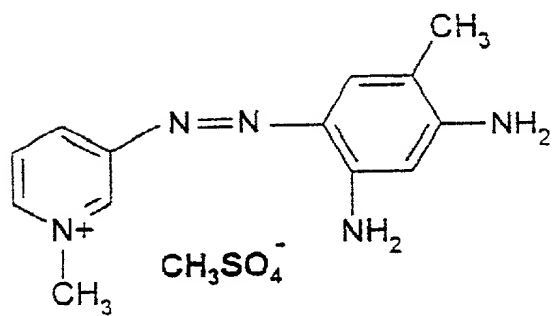
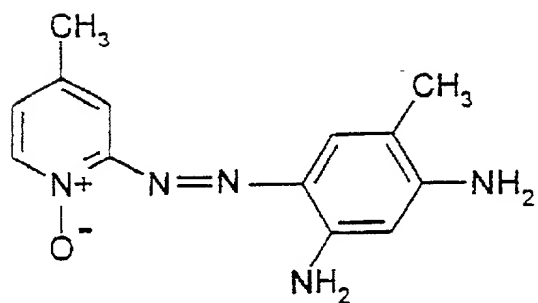
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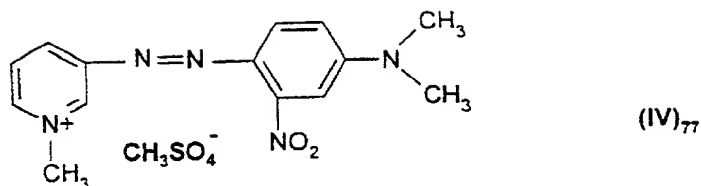
(IV)₅₄(IV)₅₅(IV)₅₆(IV)₅₇(IV)₅₈

(IV)₅₉(IV)₆₀(IV)₆₁(IV)₆₂(IV)₆₃

(IV)₆₄(IV)₆₅(IV)₆₆(IV)₆₇

(IV)₆₈(IV)₆₉(IV)₇₀(IV)₇₁(IV)₇₂

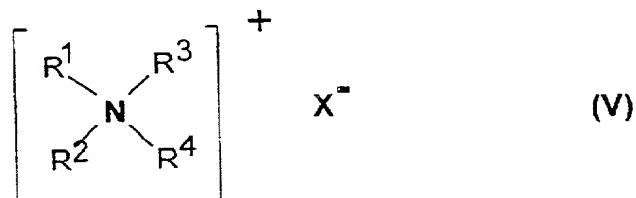
(IV)₇₃(IV)₇₄(IV)₇₅(IV)₇₆



The cationic direct dye(s) used according to the invention preferably represent from 0.001 to 10% by weight approximately of the total weight of the dyeing composition and still more preferably from 0.005 to 5% by weight approximately of this weight.

(ii) The quaternary ammonium salts which can be used according to the present invention are chosen from the group consisting of:

(ii)₁ - those of the following formula (V):

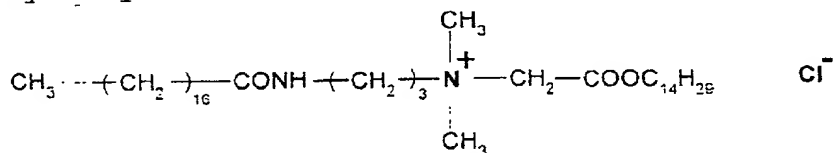


in which

the radicals R^1 and R^4 , which are identical or different, denote a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising from 1 to about 30 carbon atoms, or an alkoxy, alkoxy carbonyl alkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl or alkylaryl radical comprising from about 12 to about 30 carbon atoms, with at

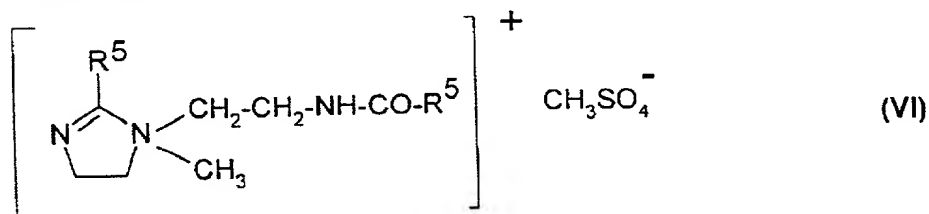
least one radical among R^1 , R^2 , R^3 and R^4 denoting a radical comprising from 8 to 30 carbon atoms;
 X^- is an anion chosen from the group comprising halides, phosphates, acetates, lactates and alkyl sulphates;

Among them, there may be mentioned, for example,
 (a) the dialkyldimethylammonium or alkyltrimethylammonium salts in which the alkyl radical comprises from about 12 to about 22 carbon atoms, such as the distearyldimethylammonium, cetyltrimethylammonium or behenyltrimethylammonium chlorides, (b) the di(C_1 - C_2 alkyl)(C_{12} - C_{22} alkyl)hydroxy(C_1 - C_2 alkyl)ammonium salts such as oleocetylhydroxyethylammonium chloride, or alternatively (c) the stearamidopropyldimethyl (myristyl acetate) ammonium chloride of formula:



sold under the trademark CERAPHYL 70 by the company VAN DYK.

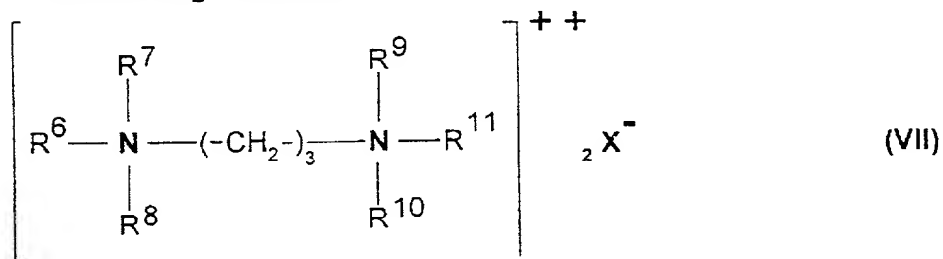
(ii)₂ - the imidazolium salts of the following formula (VI):



in which,

R^5 is chosen from the alkenyl and/or alkyl radicals comprising from 13 to 31 carbon atoms and derived from tallow fatty acids, such as the product sold under the trademark "REWOQUAT W 7500" by the company REWO;

(ii)₃ - the quaternary diammonium salts of the following formula (VII):



in which,

R^6 denotes an aliphatic radical comprising from about 16 to 30 carbon atoms, R^7 , R^8 , R^9 , R^{10} and R^{11} are chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms, and X^- is an anion chosen from the group comprising halides, acetates, phosphates and sulphates. Such quaternary diammonium salts comprise in particular propanetallowdiammonium dichloride.

According to the present invention, the quaternary ammonium salts of formula (V) are preferred in which R^1 to R^4 , which are identical or different, denote alkyl or hydroxyalkyl radicals comprising from about 12 to about 22 carbon atoms, and in particular

behenyltrimethylammonium chloride,
cetyltrimethylammonium chloride and
oleocetyldimethylhydroxyethylammonium chloride.

The quaternary ammonium salt(s) (ii) used
5 according to the invention preferably represent from
0.01 to 10% by weight approximately of the total weight
of the dyeing composition and still more preferably
from 0.05 to 5% by weight approximately of this weight.

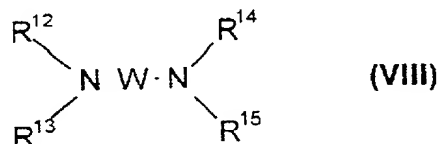
The appropriate dyeing medium (or carrier)
10 generally consists of water or of a mixture of water
and of at least one organic solvent for solubilizing
the compounds which would not be sufficiently soluble
in water. As organic solvent, there may be mentioned
for example the C₁-C₄ lower alkanols such as ethanol and
15 isopropanol, the aromatic alcohols such as benzyl
alcohol as well as similar products and mixtures
thereof.

The solvents may be present in proportions
preferably of between 1 and 40% by weight approximately
20 relative to the total weight of the dyeing composition,
and still more preferably between 5 and 30% by weight
approximately.

The pH of the dyeing composition in
accordance with the invention is generally between 2
25 and 11 approximately, and preferably between 5 and 10
approximately. It may be adjusted to the desired value
by means of acidifying or alkalinizing agents normally
used in dyeing keratinous fibres.

Among the acidifying agents, there may be mentioned, by way of example, the inorganic or organic acids such as hydrochloric acid, orthophosphoric acid, sulphuric acid, carboxylic acids such as acetic acid, tartaric acid, citric acid, lactic acid, sulphonic acids.

Among the alkalinizing agents, there may be mentioned, by way of example, aqueous ammonia, alkali metal carbonates, alkanolamines such as mono-, di- and triethanolamines as well as derivatives thereof, sodium or potassium hydroxides and the compounds having the following formula (VIII):



in which W is a propylene residue which is optionally substituted with a hydroxyl group or a C₁-C₆ alkyl radical; R¹², R¹³, R¹⁴ and R¹⁵, which are identical or different, represent a hydrogen atom, a C₁-C₆ alkyl radical or a C₁-C₆ hydroxyalkyl radical.

The dyeing composition in accordance with the invention may, in addition to the cationic direct dye(s) (i) defined above, contain one or more additional direct dyes which may for example be chosen from the nitrobenzene dyes, the anthraquinone dyes, the naphthoquinone dyes, the triarylmethane dyes, the xanthene dyes, the noncationic azo dyes.

When it is intended for oxidation dyeing, the dyeing composition in accordance with the invention contains, in addition to the cationic direct dye(s) (i), one or more oxidation bases chosen from the

5 oxidation bases conventionally used for oxidation dyeing and among which there may be mentioned in particular the para-phenylenediamines, the bis-phenylalkylenediamines, the para-aminophenols, the ortho-aminophenols and the heterocyclic bases.

10 When they are used, the oxidation base(s) preferably represent from 0.0005 to 12% by weight approximately of the total weight of the dyeing composition, and still more preferably from 0.005 to 6% by weight approximately of this weight.

15 When it is intended for oxidation dyeing, the dyeing composition in accordance with the invention may also contain, in addition to the cationic direct dye (i) and the quaternary ammonium salt (ii) as well as oxidation bases, one or more couplers so as to modify

20 or increase the shimmer of the shades obtained using the cationic direct dye(s) (i) and the oxidation base(s).

The couplers which can be used in the dyeing composition in accordance with the invention may be

25 chosen from the couplers conventionally used in oxidation dyeing and among which there may be mentioned in particular the meta-phenylenediamines, the meta-

aminophenols, the meta-diphenols and the heterocyclic couplers.

When they are present, the coupler(s) preferably represent from 0.0001 to 10% by weight approximately of
5 the total weight of the dyeing composition and still more preferably from 0.005 to 5% by weight approximately of this weight.

The dyeing composition in accordance with the invention may also contain various adjuvants which are
10 conventionally used in hair-dyeing compositions, such as antioxidants, penetrating agents, sequestrants, perfumes, buffers, dispersing agents, film-forming agents, ceramides, preservatives, screening agents and opacifying agents.

15 Of course, persons skilled in the art will be careful to choose this or these optional additional compounds such that the advantageous properties intrinsically attached to the dyeing composition in accordance with the invention are not, or not
20 substantially, altered by the addition(s) envisaged.

The dyeing composition according to the invention may be provided in various forms, such as in the form of liquids, shampoos, creams, gels, or in any other form appropriate for dyeing keratinous fibres,
25 and in particular human hair. It may be obtained by freshly mixing a composition, which is optionally pulverulent, containing the cationic direct dye(s) with a composition containing the quaternary ammonium salt.

When the combination of the cationic direct dye (i) and of the quaternary ammonium salt (ii) according to the invention is used in a composition intended for oxidation dyeing (one or more oxidation bases are then used, optionally in the presence of one or more couplers) or when it is used in a composition intended for direct lightening dyeing, then the dyeing composition in accordance with the invention contains, in addition, at least one oxidizing agent chosen for example from hydrogen peroxide, urea peroxide, alkali metal bromates, persalts such the perborates and persulphates, and enzymes such as peroxidases, laccases and oxidoreductases containing two electrons. The use of hydrogen peroxide or of enzymes is particularly preferred.

Another subject of the invention is a method of dyeing keratinous fibres and in particular human keratinous fibres such as hair using the dyeing composition as defined above.

According to a first variant of this dyeing method in accordance with the invention, at least one dyeing composition as defined above is applied to the fibres for a sufficient time to develop the desired colour, after which they are rinsed, optionally washed with shampoo, rinsed again and dried.

The time necessary for the development of the colour on the keratinous fibres is generally between 3

and 60 minutes and still more preferably 5 and 40 minutes.

According to a second variant of this dyeing method in accordance with the invention, at least one
5 dyeing composition as defined above is applied to the fibres for a sufficient time to develop the desired colour, with no final rinsing.

According to a particular embodiment of this dyeing method, and when the dyeing composition in
10 accordance with the invention contains at least one oxidation base and at least one oxidizing agent, the dyeing method comprises a preliminary stage consisting of storing in a separate form, on the one hand, a composition (A1) comprising, in an appropriate dyeing
15 medium, at least one cationic direct dye (i) as defined above and at least one oxidation base and, on the other hand, a composition (B1) containing, in an appropriate dyeing medium, at least one oxidizing agent, and then mixing them at the time of use before applying this
20 mixture to the keratinous fibres, the composition (A1) or the composition (B1) containing the quaternary ammonium salt (ii) as defined above.

According to another particular embodiment of this dyeing method, and when the dyeing composition in
25 accordance with the invention contains at least one oxidizing agent, the dyeing method comprises a preliminary stage consisting of storing in a separate form, on the one hand, a composition (A2) comprising,

in an appropriate dyeing medium, at least one cationic direct dye (i) as defined above and, on the other hand, a composition (B2) containing, in an appropriate dyeing medium, at least one oxidizing agent, and then mixing
 5 them at the time of use before applying this mixture to the keratinous fibres, the composition (A2) or the composition (B2) containing the quaternary ammonium salt as defined above.

Another subject of the invention is a
 10 multicompartment device or dyeing "kit" or any other multicompartment packaging system in which a first compartment contains composition (A1) or (A2) as defined above and a second compartment contains composition (B1) or (B2) as defined above. These
 15 devices may be equipped with a means allowing the desired mixture to be delivered to the hair, such as the devices described in patent FR-2,586,913 in the applicant's name.

The following examples are intended to
 20 illustrate the invention without, however, limiting the scope thereof.

EXAMPLES

Examples 1 to 3:

25 The three direct dyeing compositions which are assembled in the following table were prepared:
(all contents expressed in grams)

EXAMPLES No. →	1	2	3
Cationic direct dye of formula (I1)	0.20		
Cationic direct dye of formula (I14)		0.20	
Cationic direct dye of formula (IV) ₂₇			0.10
Oleocetyldimethylhydroxyethyl)-ammonium chloride	2.0 AS*		
Behenyltrimethylammonium chloride		2.0 AS*	
Cetyltrimethylammonium chloride			2.0 AS*
Ethanol	10	10	10
2-amino-2-methyl-1-propanol qs	pH 9	pH 9	pH 9
Demineralized water qs	100	100	100

AS* denotes Active Substance

The above compositions were each applied for 30 minutes to locks of natural grey hair which is 90% white. The hair locks were then rinsed, washed with a standard shampoo and then dried.

The locks were dyed in the following shades:

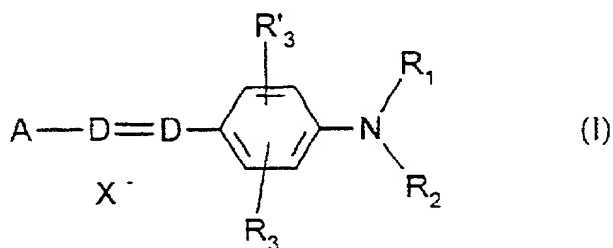
Examples	Shades obtained
1	dark red
2	dark orange
3	dark purple

CLAIMS

1. Composition for dyeing keratinous fibres and in particular human keratinous fibres such as hair, containing in an appropriate dyeing medium, (i) at
 5 least compound chosen from those of the following formulae (I), (II), (III), (III'), (IV):

a) the compounds of the following formula

(I):



10 in which:

D represents a nitrogen atom or the -CH group,

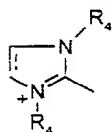
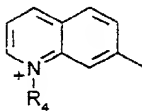
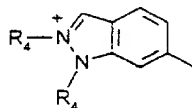
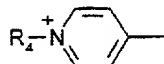
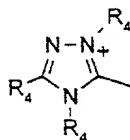
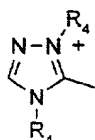
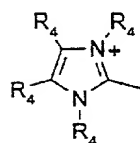
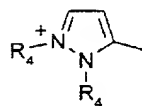
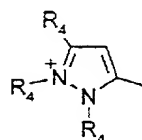
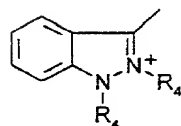
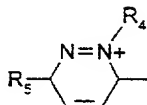
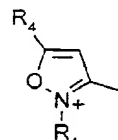
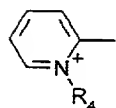
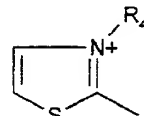
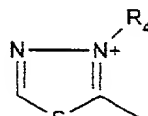
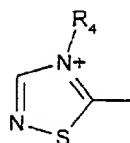
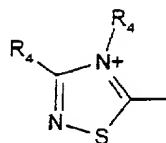
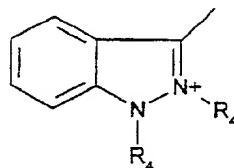
R₁ and R₂, which are identical or different, represent a hydrogen atom; a C₁-C₄ alkyl radical which
 15 may be substituted with a -CN, -OH or -NH₂ radical or form with a carbon atom of the benzene ring an optionally oxygen-containing or nitrogen-containing heterocycle which may be substituted with one or more C₁-C₄ alkyl radicals; a 4'-aminophenyl radical,

20 R₃ and R'₃, which are identical or different, represent a hydrogen or halogen atom chosen from chlorine, bromine, iodine and fluorine, a cyano, C₁-C₄ alkyl, C₁-C₄ alkoxy or acetyloxy radical,

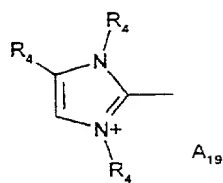
X^- represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

A represents a group chosen from the following structures A_1 to A_{19} :

5

 A_1  A_2  A_3  A_4  A_5  A_6  A_7  A_8  A_9  A_{10}  A_{11}  A_{12}  A_{13}  A_{14}  A_{15}  A_{16}  A_{17}  A_{18}

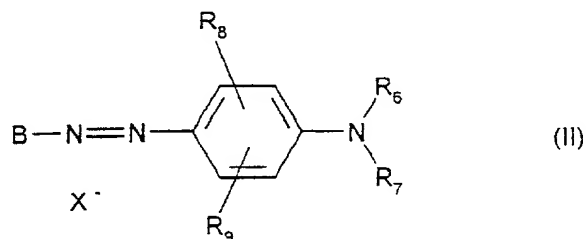
and



in which R_4 represents a C_1 - C_4 alkyl radical which may be substituted with a hydroxyl radical and R_5 represents
 5 a C_1 - C_4 alkoxy radical, with the proviso that when D represents $-CH$, A represents A_4 or A_{13} and R_3 is different from an alkoxy radical, then R_1 and R_2 do not simultaneously denote a hydrogen atom;

b) the compounds of the following formula

10 **(II):**



in which:

R_6 represents a hydrogen atom or a C_1 - C_4 alkyl radical,

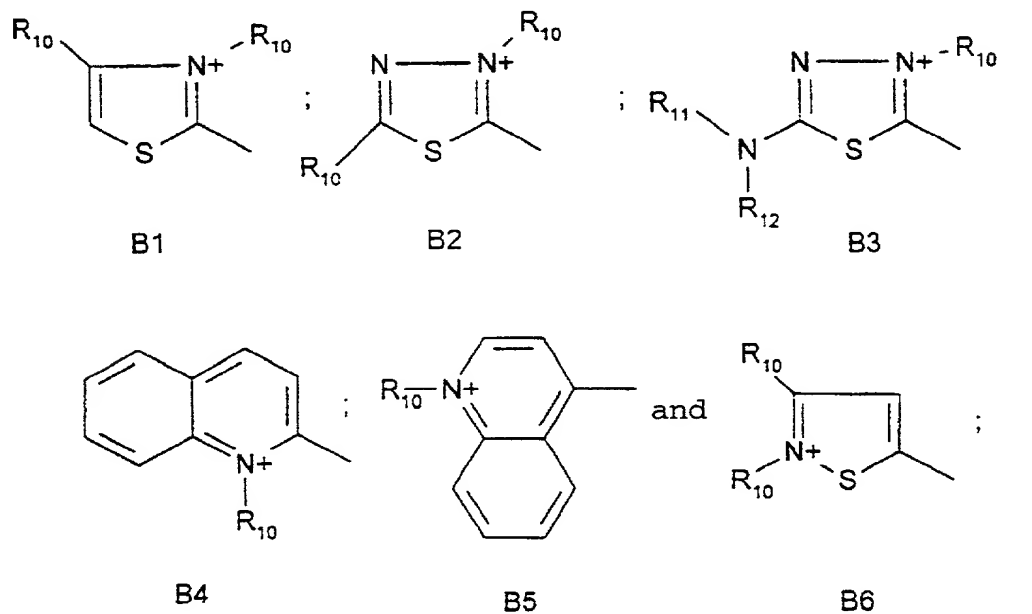
15 R_7 represents a hydrogen atom, an alkyl radical which may be substituted with a $-CN$ radical or with an amino group, a 4'-aminophenyl radical or forms with R_6 an optionally oxygen-containing and/or nitrogen-containing heterocycle which may be substituted with a
 20 C_1 - C_4 alkyl radical,

R_8 and R_9 , which are identical or different, represent a hydrogen atom, a halogen atom such as

bromine, chlorine, iodine or fluorine, a C₁-C₄ alkyl or C₁-C₄ alkoxy radical, a -CN radical,

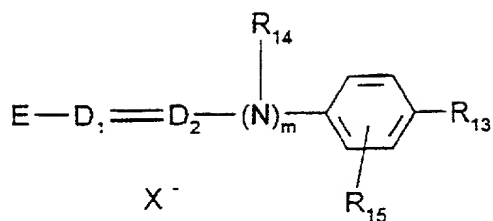
X⁻ represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

5 B represents a group chosen from the following structures B1 to B6:

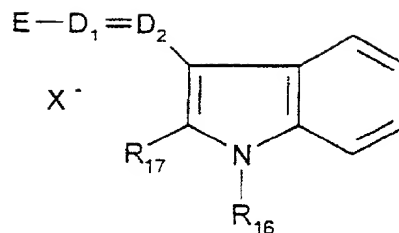


in which R₁₀ represents a C₁-C₄ alkyl radical, R₁₁ and R₁₂, which are identical or different, represent a
10 hydrogen atom or a C₁-C₄ alkyl radical;

c) the compounds of the following formulae
(III) and (III'):



(III)



(III')

in which:

R_{13} represents a hydrogen atom, a C_1 - C_4 alkoxy radical, a halogen atom such as bromine, chlorine,
 5 iodine or fluorine or an amino radical,

R_{14} represents a hydrogen atom, a C_1 - C_4 alkyl radical or forms with a carbon atom of the benzene ring a heterocycle which is optionally oxygen-containing and/or substituted with one or more C_1 - C_4 alkyl groups,

10 R_{15} represents a hydrogen or halogen atom such as bromine, chlorine, iodine or fluorine,

R_{16} and R_{17} , which are identical or different, represent a hydrogen atom or a C_1 - C_4 alkyl radical,

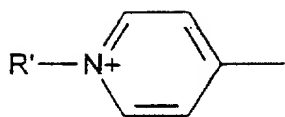
15 D_1 and D_2 , which are identical or different, represent a nitrogen atom or the $-CH$ group,

$m = 0$ or 1 ,

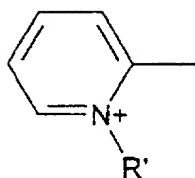
it being understood that when R_{13} represents an unsubstituted amino group, then D_1 and D_2 simultaneously represent a $-CH$ group and $m = 0$,

20 X^- represents an anion which is preferably chosen from chloride, methylsulphate and acetate,

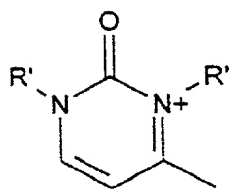
E represents a group chosen from the following structures E1 to E8: .



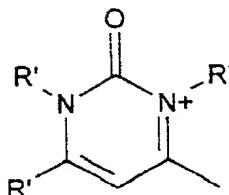
E1



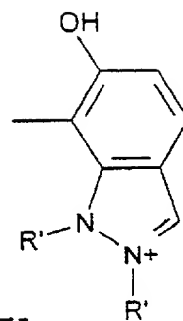
E2



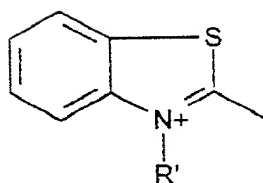
E3



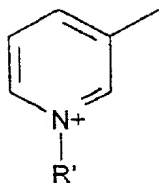
E4



E5

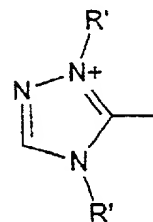


E6



E7

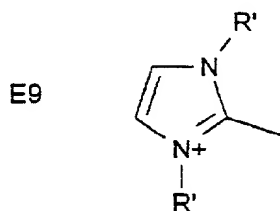
and



E8

in which R' represents a C₁-C₄ alkyl radical;

- 5 when m = 0 and D₁ represents a nitrogen atom,
then E may also denote a group having the following
structure E9:



E9

- 10 in which R' represents a C₁-C₄ alkyl radical,

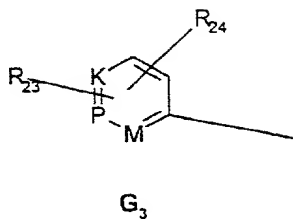
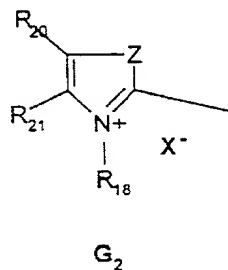
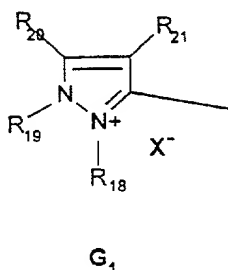
d) the compounds of the following formula

(IV) :



in which:

- 5 the symbol **G** represents a group chosen from the following structures G_1 to G_3 :



in which structures G_1 to G_3 ,

- 10 R_{18} denotes a C_1 - C_4 alkyl radical, a phenyl radical which may be substituted with a C_1 - C_4 alkyl radical or a halogen atom chosen from chlorine, bromine, iodine and fluorine;

R_{19} denotes a C_1 - C_4 alkyl radical or a phenyl radical;

- 15 R_{20} and R_{21} , which are identical or different, represent a C_1 - C_4 alkyl radical, a phenyl radical, or form together in G_1 a benzene ring which is substituted with one or more C_1 - C_4 alkyl, C_1 - C_4 alkoxy or NO_2 radicals, or form together in G_2 a benzene ring which is optionally

substituted with one or more C_1-C_4 alkyl, C_1-C_4 alkoxy or NO_2 radicals;

R_{20} may denote, in addition, a hydrogen atom;

Z denotes an oxygen or sulphur atom or an $-NR_{19}$ group;

5 M represents a group $-CH$, $-CR$ (R denoting C_1-C_4 alkyl),
or $-NR_{22}(X^-)_r$;

K represents a group $-CH$, $-CR$ (R denoting C_1-C_4 alkyl),
or $-NR_{22}(X^-)_r$;

P represents a group $-CH$, $-CR$ (R denoting C_1-C_4 alkyl),
10 or $-NR_{22}(X^-)_r$; r denotes zero or 1;

R_{22} represents an O^- atom, a C_1-C_4 alkoxy radical or a
 C_1-C_4 alkyl radical;

R_{23} and R_{24} , which are identical or different, represent
a hydrogen or halogen atom chosen from chlorine,
15 bromine, iodine and fluorine, a C_1-C_4 alkyl radical, a
 C_1-C_4 alkoxy radical or an $-NO_2$ radical;

X^- represents an anion which is preferably chosen from
chloride, iodide, methylsulphate, ethylsulphate,
acetate and perchlorate;

20 with the proviso that

if R_{22} denotes O^- , then r denotes zero;

if K or P or M denote $-N-(C_1-C_4 \text{ alkyl})X^-$, then R_{23} or R_{24}
is different from a hydrogen atom;

if K denotes $-NR_{22}(X^-)_r$, then $M = P = -CH$, $-CR$;

25 if M denotes $-NR_{22}(X^-)_r$, then $K = P = -CH$, $-CR$;

if P denotes $-NR_{22}(X^-)_r$, then $K = M$ and denote $-CH$ or
 $-CR$;

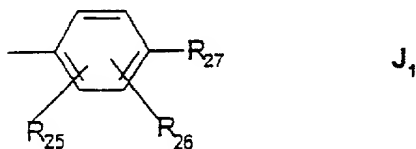
if Z denotes a sulphur atom with R_{21} denoting C_1-C_4 alkyl, then R_{20} is different from a hydrogen atom;

if Z denotes $-NR_{22}$ with R_{19} denoting C_1-C_4 alkyl, then at least one of the R_{18} , R_{20} or R_{21} radicals of G_2 is

5 different from a C_1-C_4 alkyl radical;

the symbol J represents:

-(a) a group having the following structure J_1 :



10 in which structure J_1 ,

R_{25} represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C_1-C_4 alkyl radical, a C_1-C_4 alkoxy radical, a radical $-OH$, $-NO_2$, $-NHR_{28}$, $-NR_{29}R_{30}$, $-NHCO(C_1-C_4\text{alkyl})$, or forms with

15 R_{26} a 5- or 6-membered ring containing or otherwise one or more heteroatoms chosen from nitrogen, oxygen or sulphur;

R_{26} represents a hydrogen atom, a halogen atom chosen from chlorine, bromine, iodine and fluorine, a C_1-C_4

20 alkyl or C_1-C_4 alkoxy radical, or forms with R_{27} or R_{28} a 5- or 6-membered ring containing or otherwise one or more heteroatoms chosen from nitrogen, oxygen or sulphur;

R_{27} represents a hydrogen atom, an $-OH$ radical, an $-NHR_{28}$ radical, an $-NR_{29}R_{30}$ radical;

R_{28} represents a hydrogen atom, a C_1-C_4 alkyl radical, a

C₁-C₄ monohydroxyalkyl radical, a C₂-C₄ polyhydroxyalkyl radical, a phenyl radical;

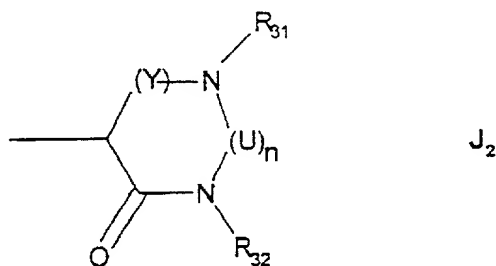
R₂₉ and R₃₀, which are identical or different, represent a C₁-C₄ alkyl radical, a C₁-C₄ monohydroxyalkyl radical,

5 a C₂-C₄ polyhydroxyalkyl radical;

-(b) a 5- or 6- membered nitrogen-containing heterocycle group which is capable of containing other heteroatoms and/or carbonyl-containing groups and which may be substituted with one or more C₁-C₄ alkyl, amino

10 or phenyl radicals,

and in particular a group having the following structure J₂:



15 in which structure J₂,

R₃₁ and R₃₂, which are identical or different, represent a hydrogen atom, a C₁-C₄ alkyl radical, a phenyl radical;

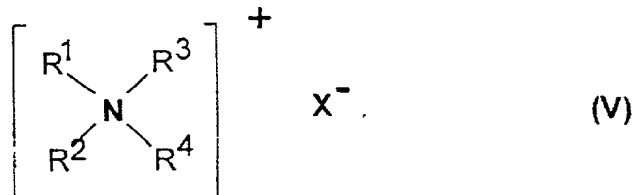
Y denotes the -CO- radical or the radical $\text{—}\overset{\text{CH}_3}{\underset{|}{\text{C}}}=\text{}$;

20 n = 0 or 1, with, when n denotes 1, U denotes the -CO-radical.

the said composition being characterized in that it contains, in addition,

(ii) at least one quaternary ammonium salt chosen from the group comprising:

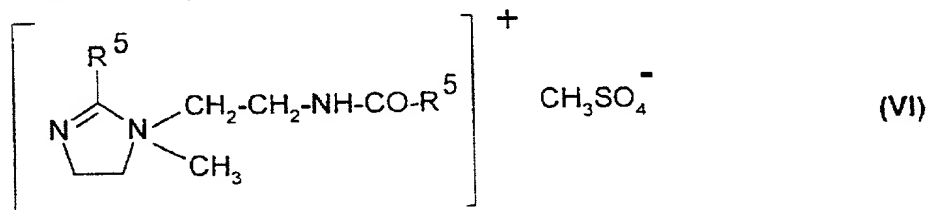
(ii)₁ - those of the following formula (V):



5 in which,

the radicals R¹ to R⁴, which are identical or different, denote a saturated or unsaturated, linear or branched, aliphatic hydrocarbon radical comprising from 1 to ~~about~~ 30 carbon atoms, or an
 10 alkoxy, alkoxy carbonyl alkyl, polyoxyalkylene, alkylamido, alkylamidoalkyl, hydroxyalkyl, aromatic, aryl or alkylaryl radical comprising from 12 to about 30 carbon atoms, with at least one radical among R¹, R², R³ and R⁴ denoting a
 15 radical comprising from 8 to 30 carbon atoms;
 X⁻ is an anion chosen from the group ~~comprising~~ ^{consisting of} halides, phosphates, acetates, lactates and alkyl sulphates;

20 (ii)₂ - the imidazolium salts of the following formula (VI):

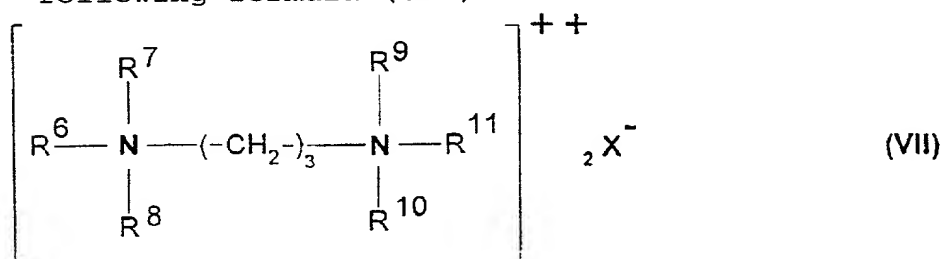


in which,

R^5 is chosen from the alkenyl and/or alkyl radicals comprising from 13 to 31 carbon atoms and derived from tallow fatty acids.

5

(ii)₃ - the quaternary diammonium salts of the following formula (VII):



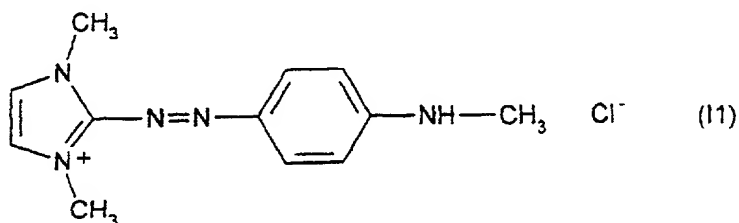
in which,

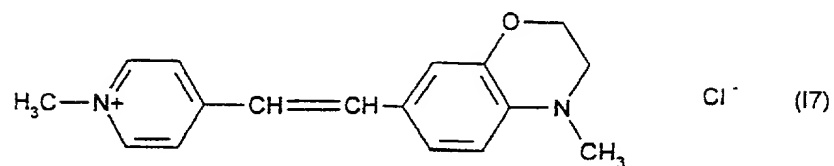
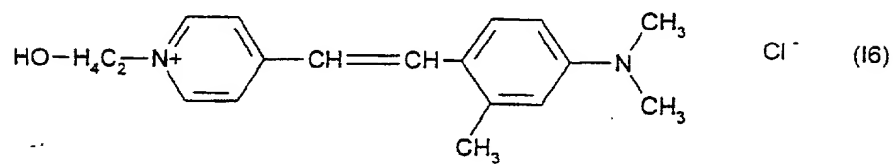
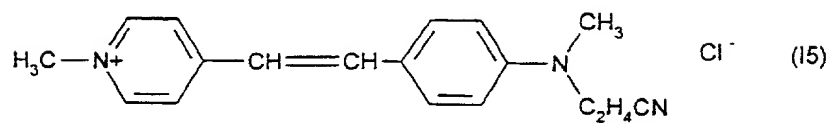
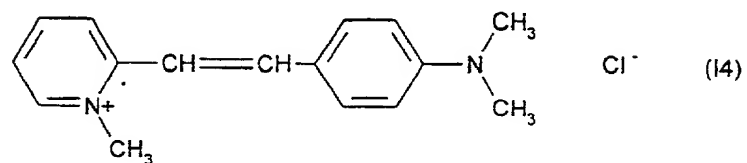
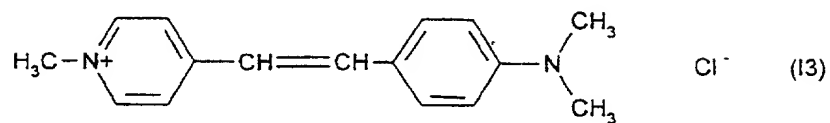
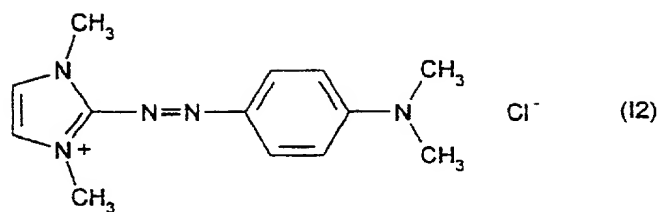
10 R^6 denotes an aliphatic radical comprising from 16 to 30 carbon atoms, R^7 , R^8 , R^9 , R^{10} and R^{11} are chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms, and X^- is an anion chosen from the group comprising halides, acetates, phosphates and sulphates.

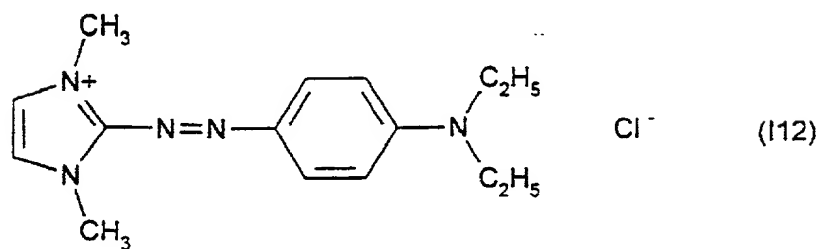
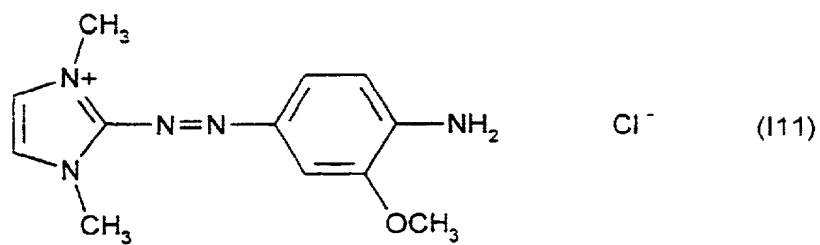
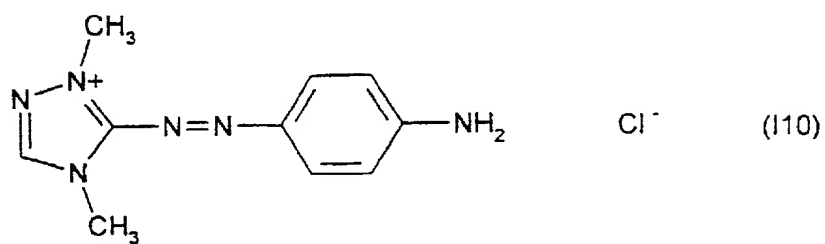
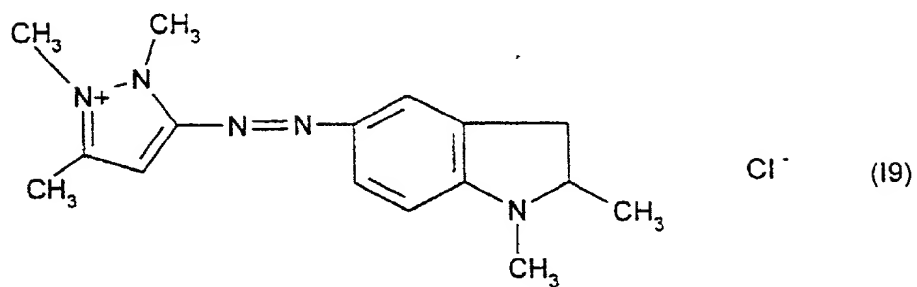
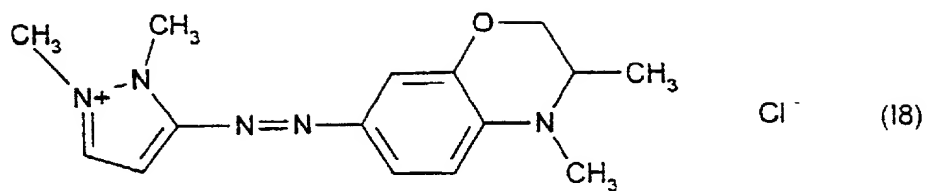
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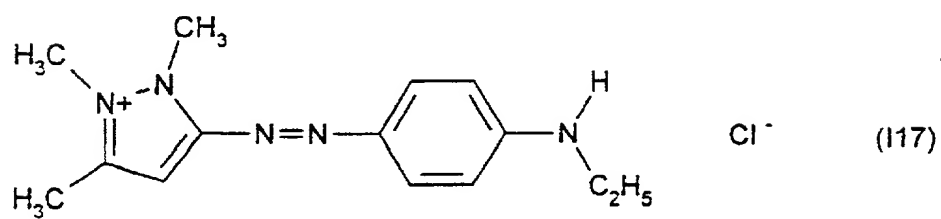
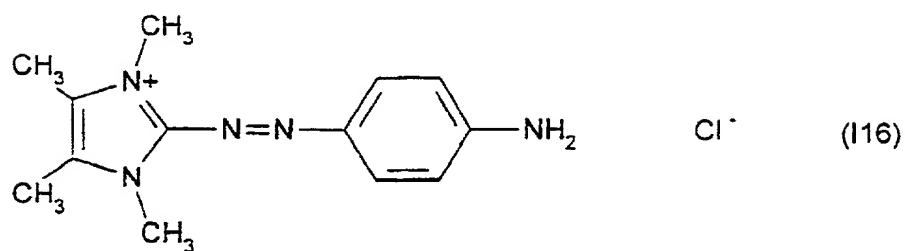
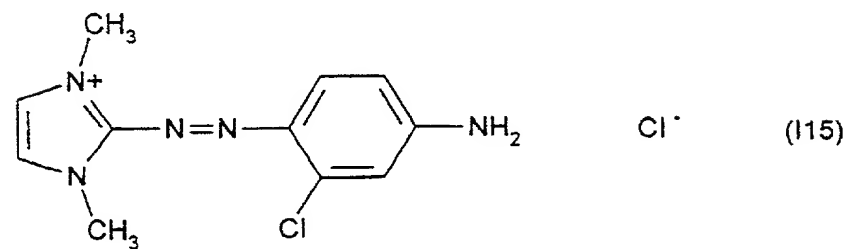
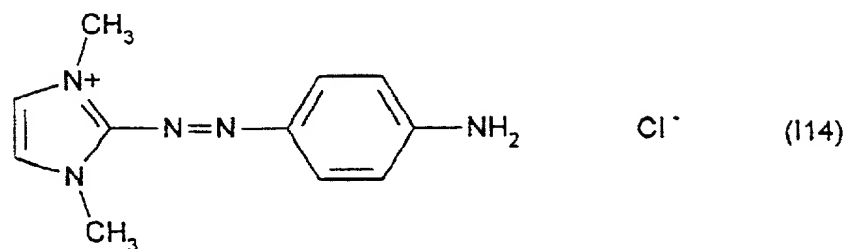
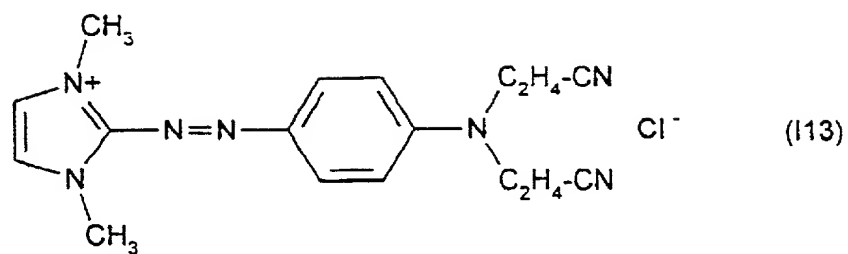
2. Composition according to Claim 1, characterized in that the cationic direct dyes of formula (I) are chosen from the compounds corresponding to the following structures (I1) to (I54):

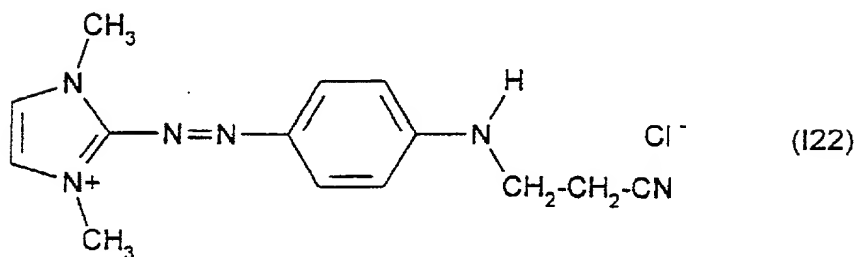
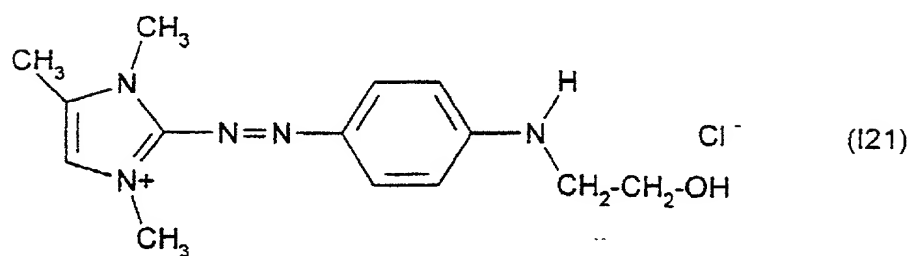
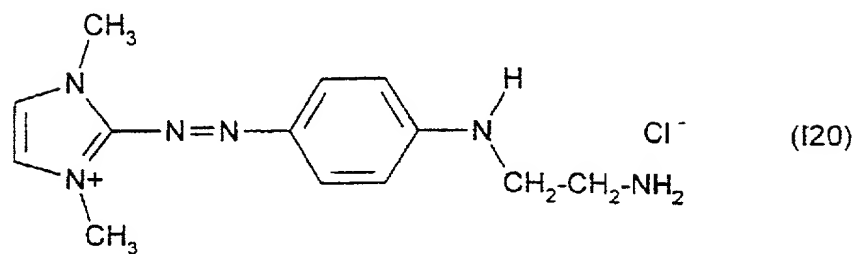
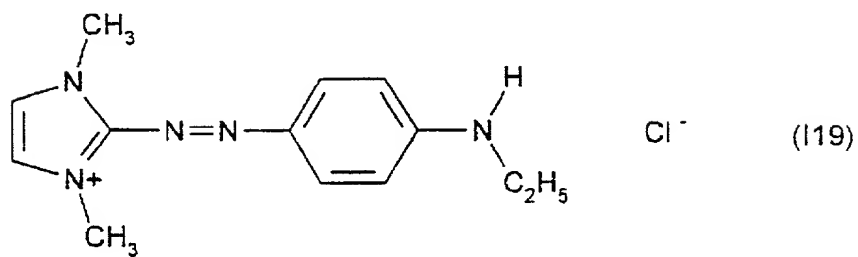
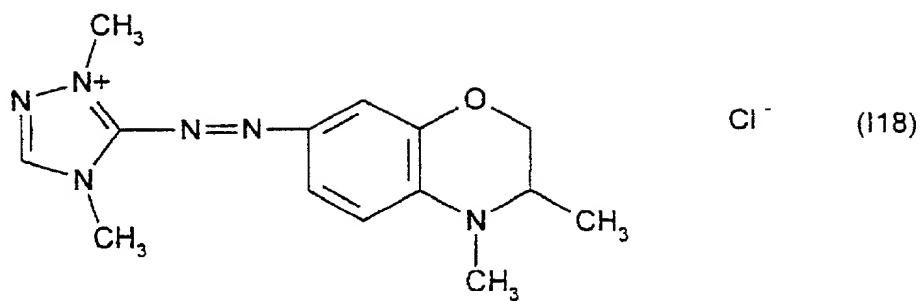
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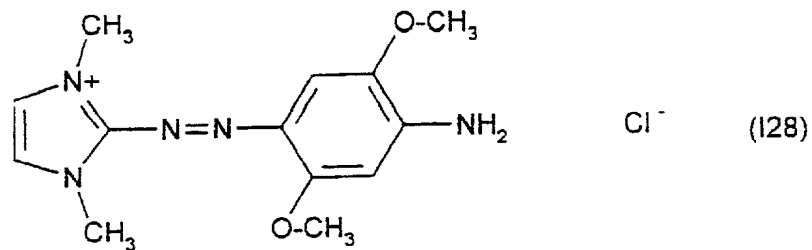
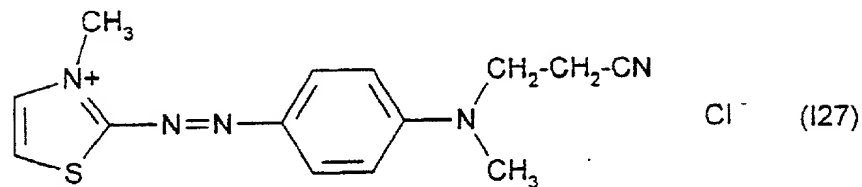
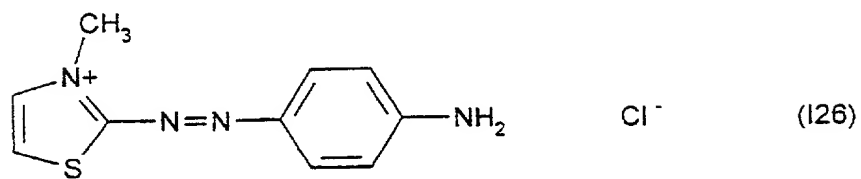
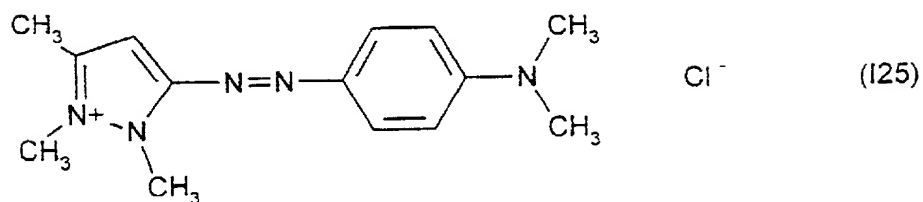
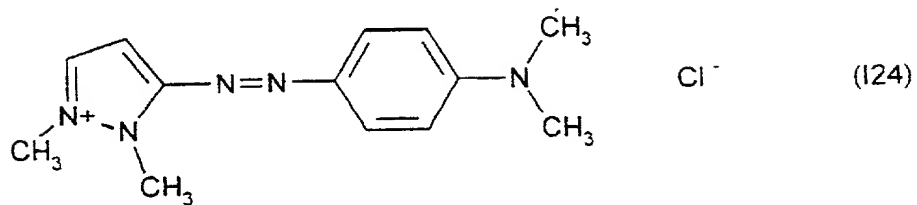
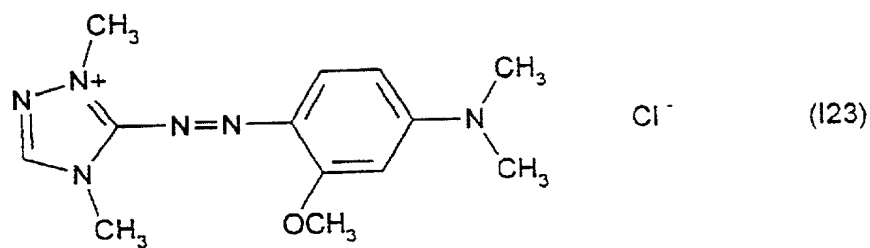


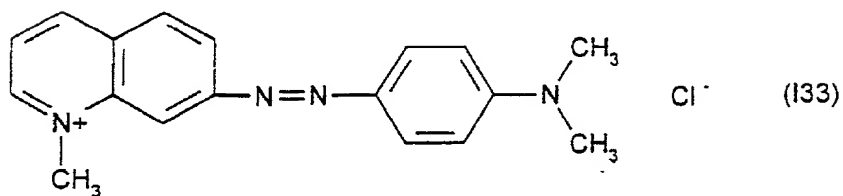
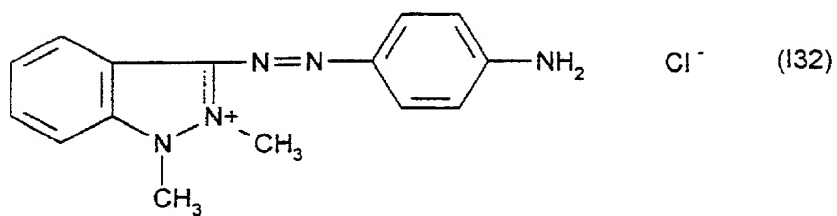
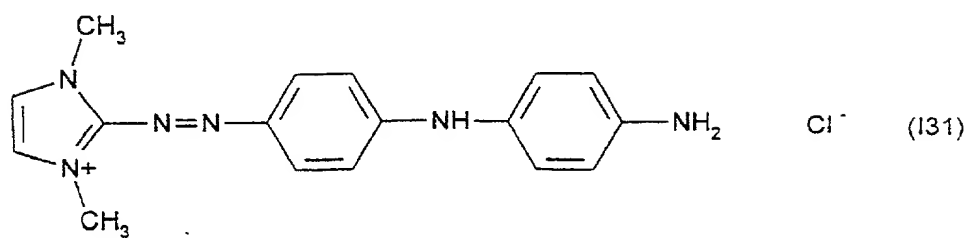
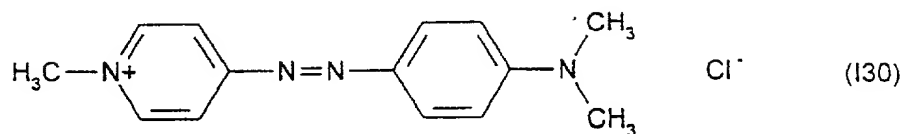
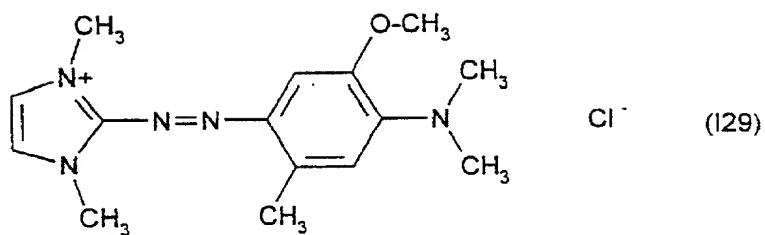


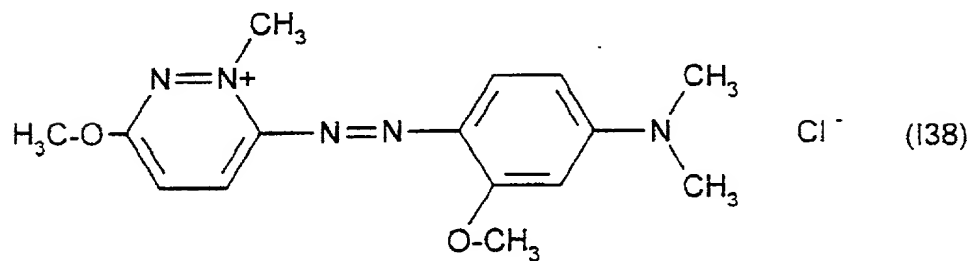
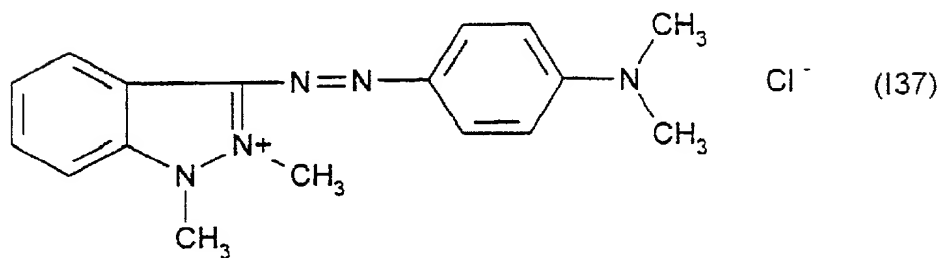
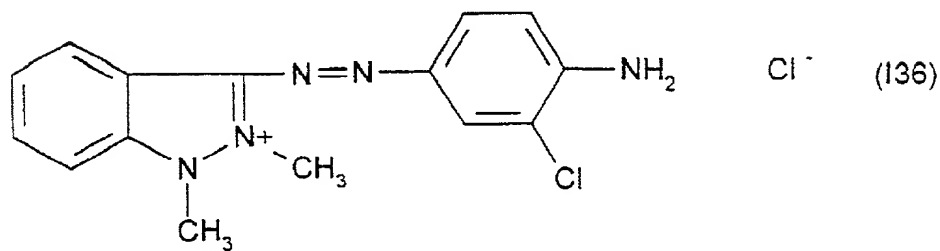
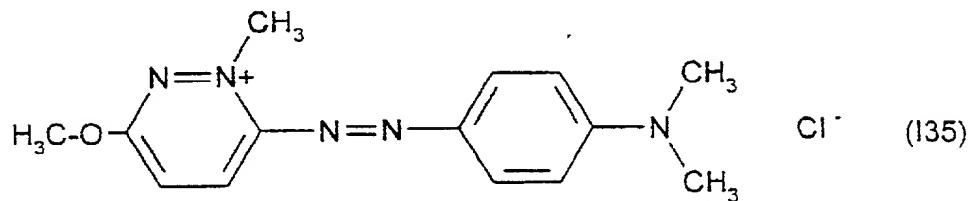
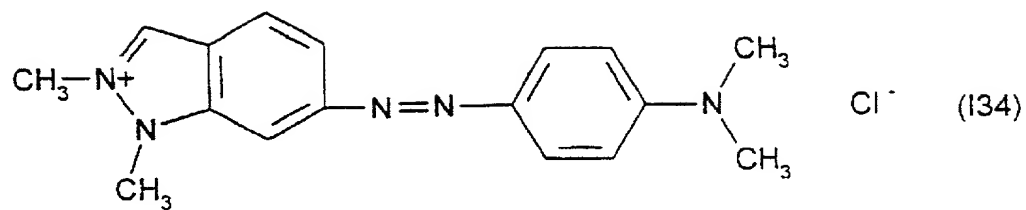


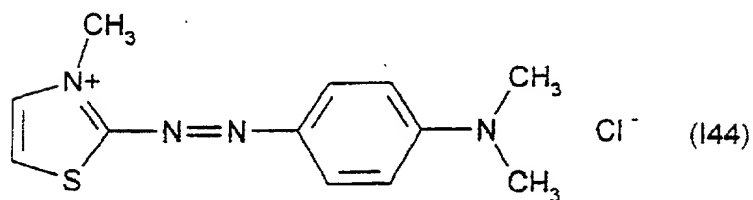
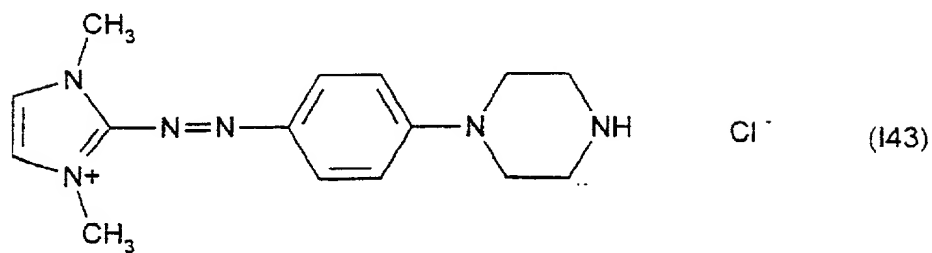
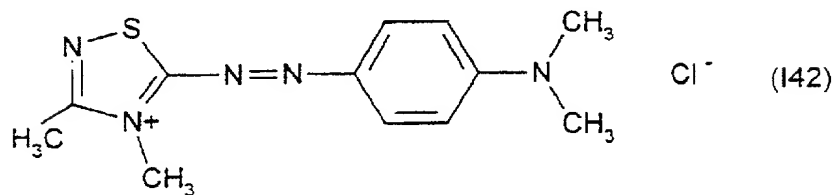
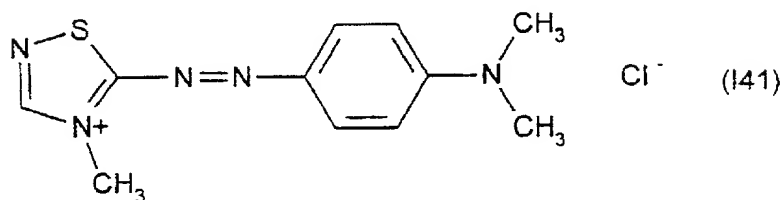
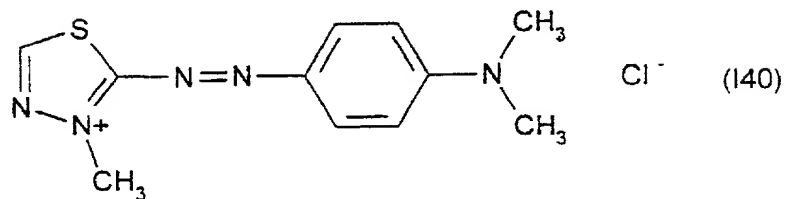
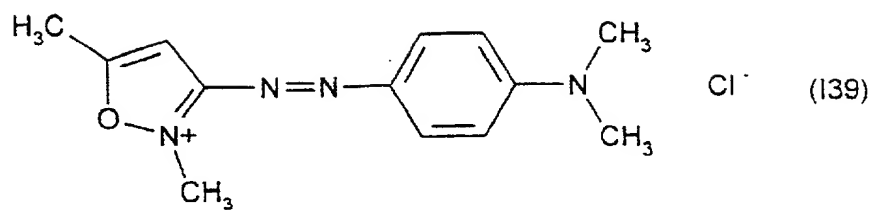


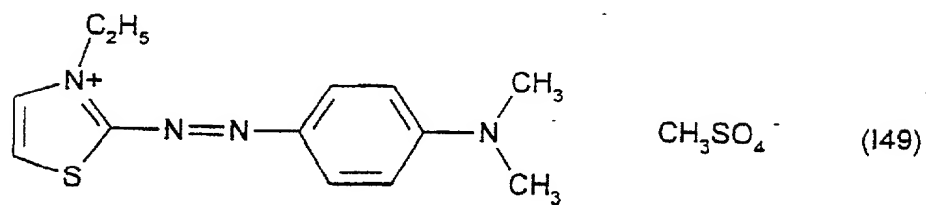
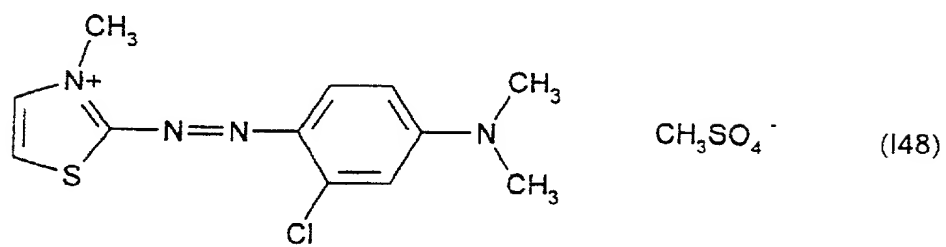
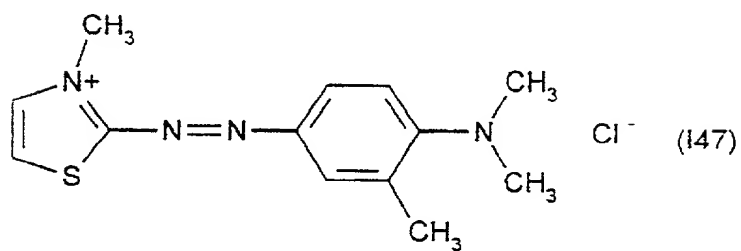
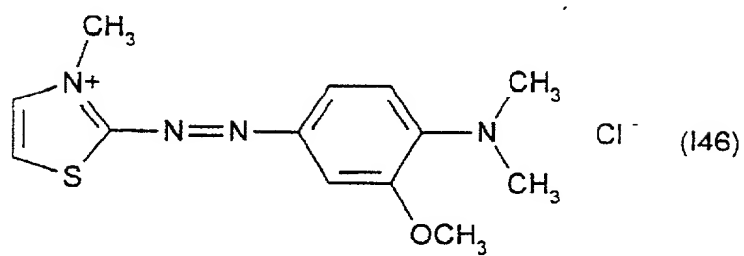
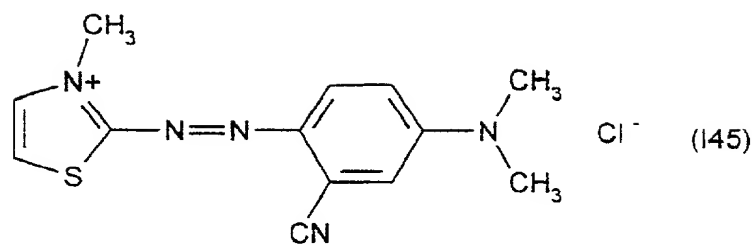


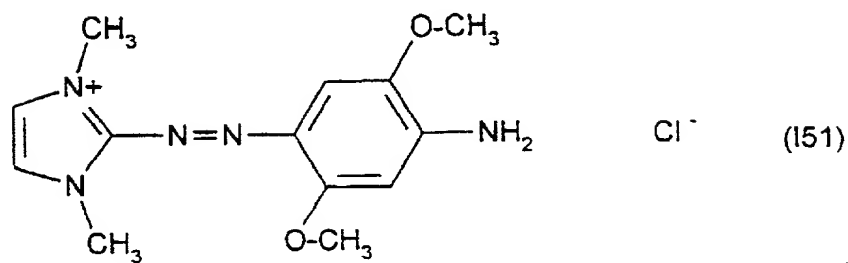
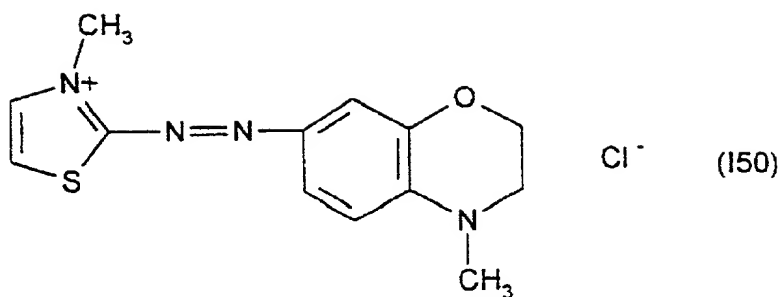




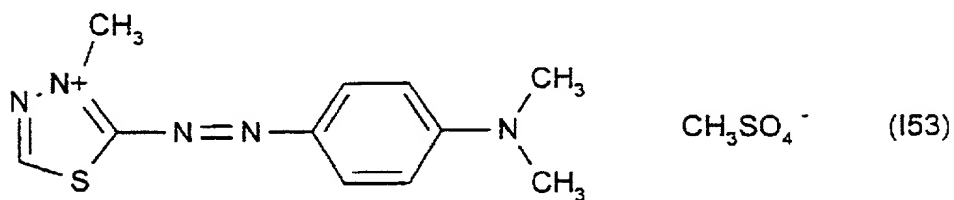
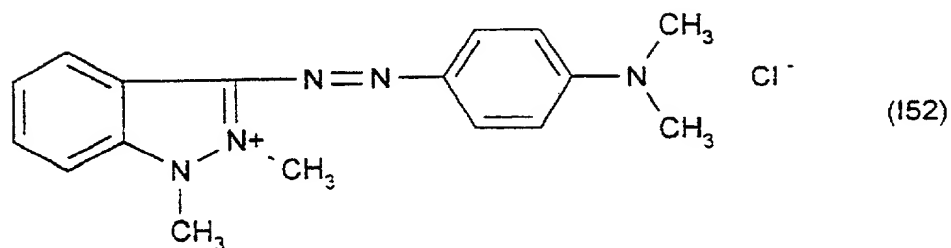




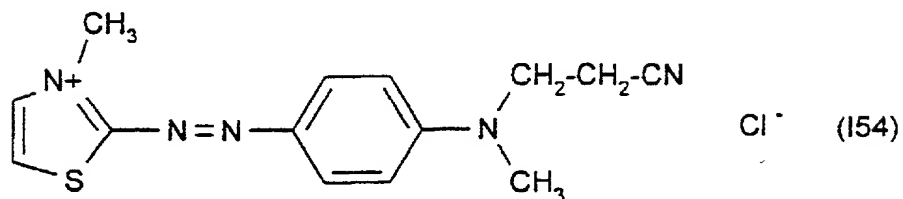




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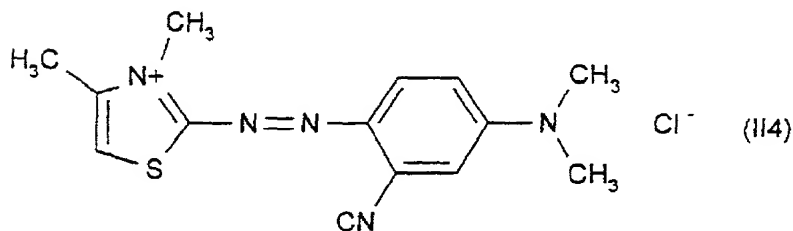
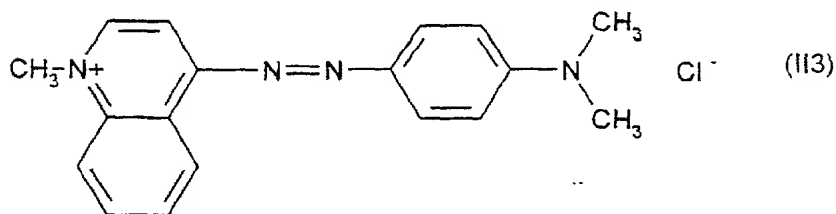
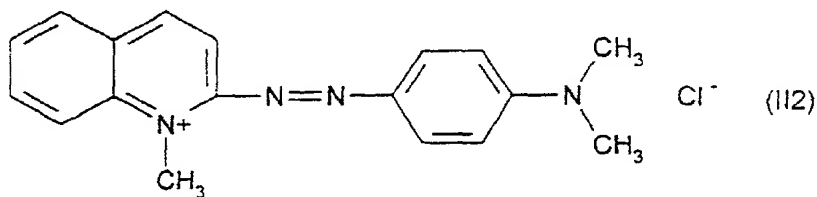
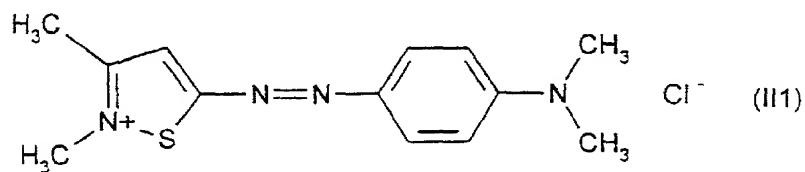


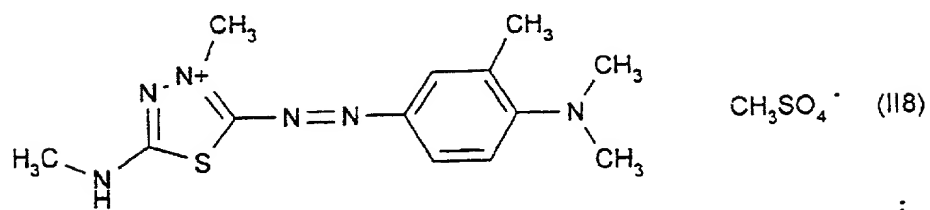
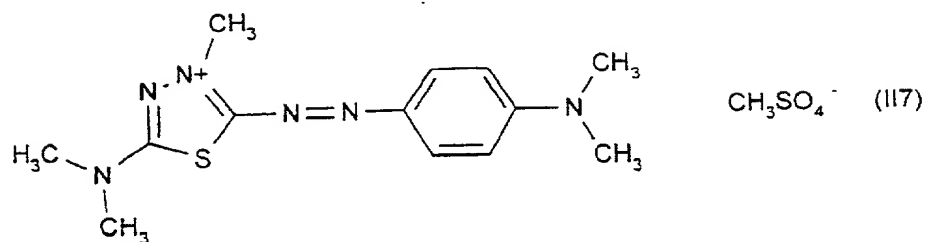
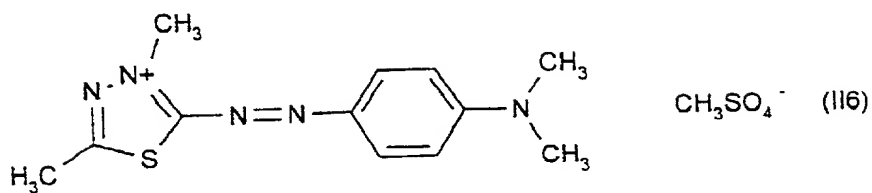
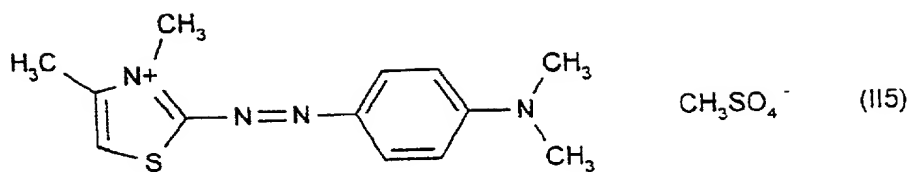
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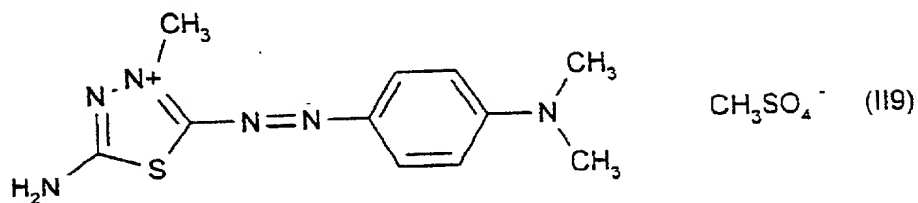
3. Composition according to Claim 2, characterized in that the cationic direct dyes correspond to the structures (I1), (I2), (I14), and (I31).

5 4. Composition according to Claim 1, characterized in that the cationic direct dyes of formula (II) are chosen from the compounds corresponding to the following structures (II1) to (II9):



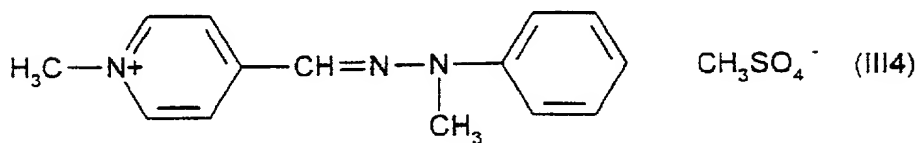
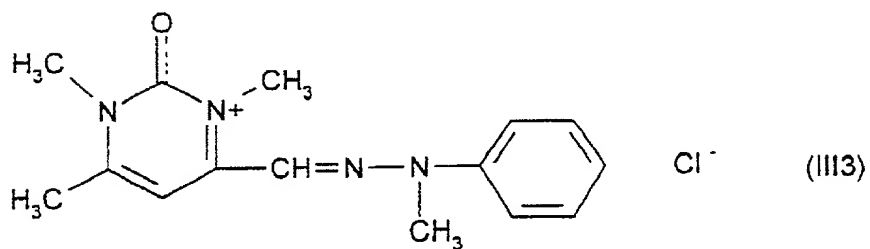
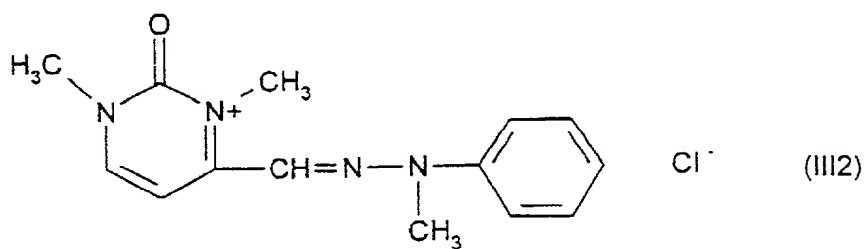
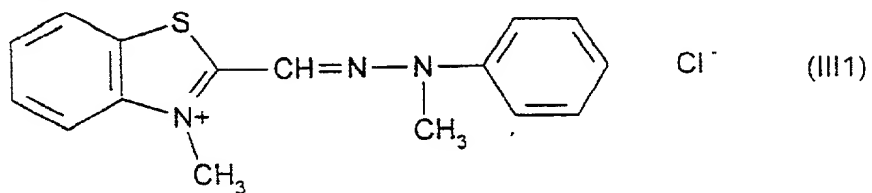


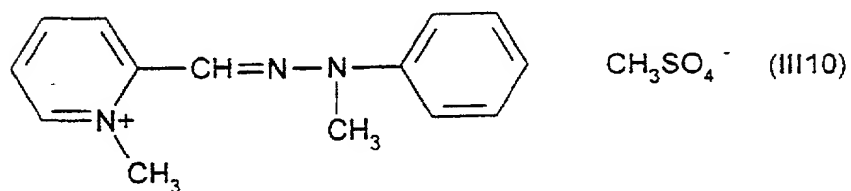
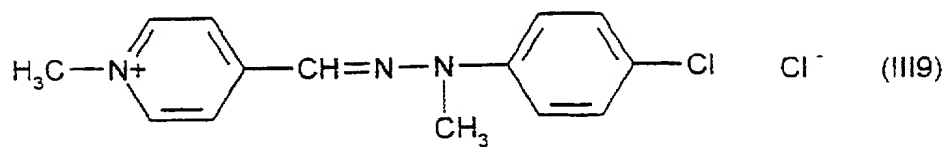
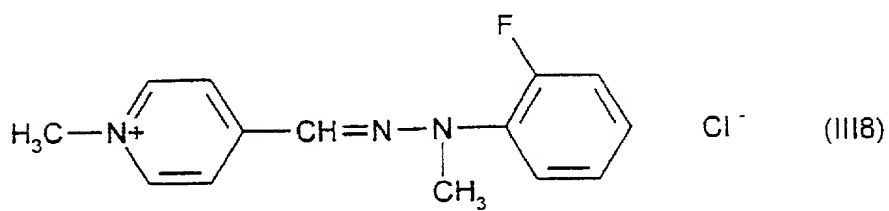
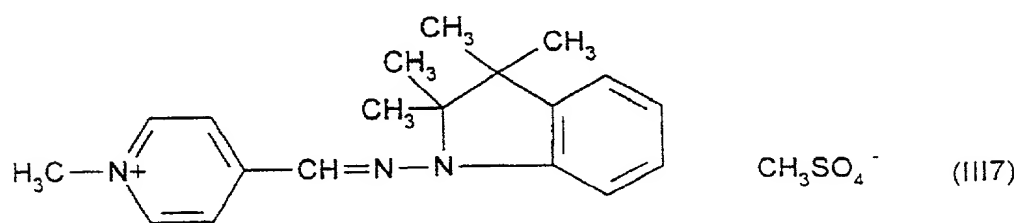
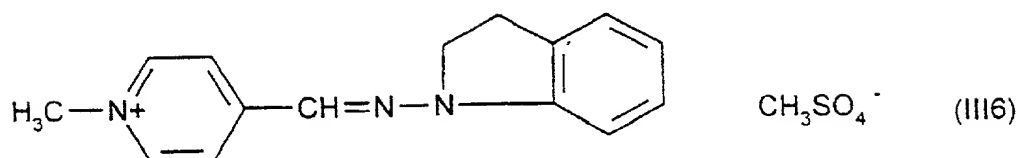
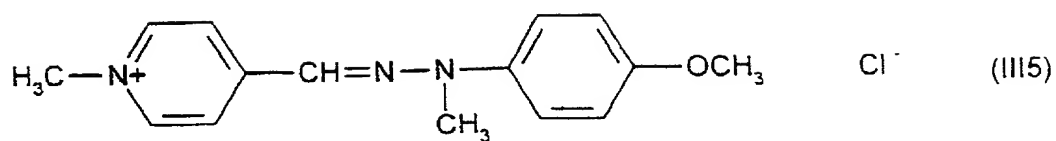
; and

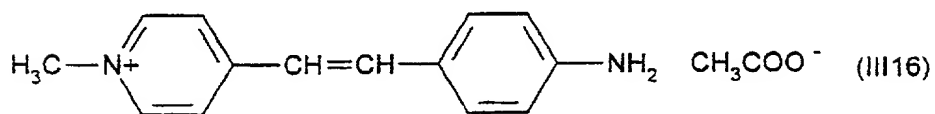
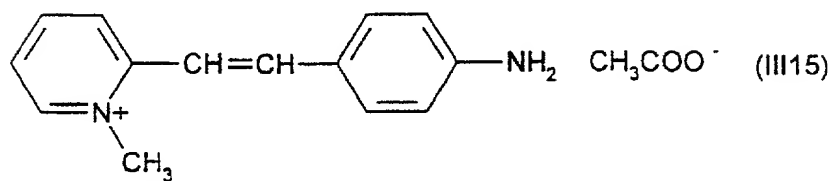
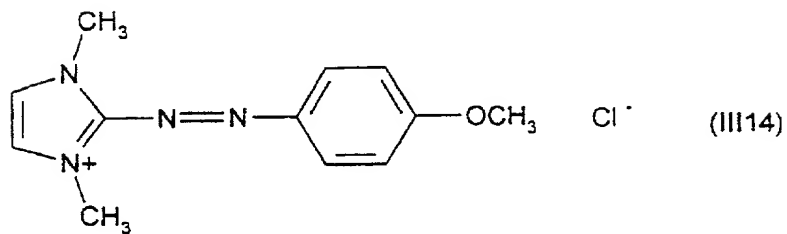
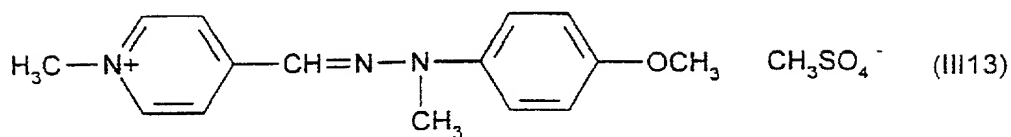
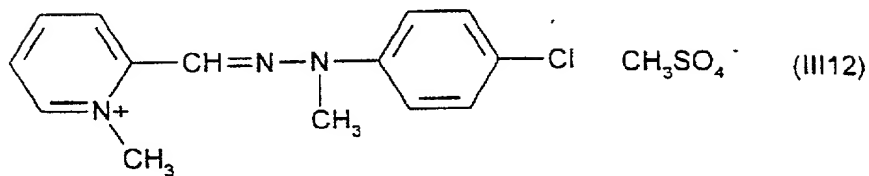
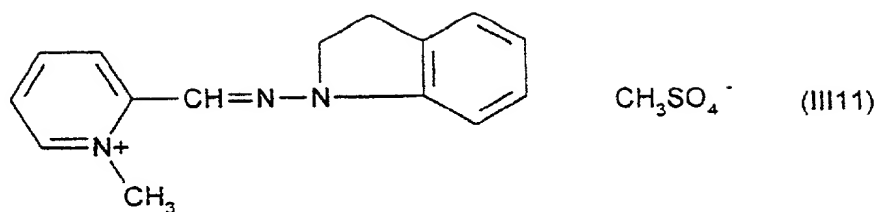


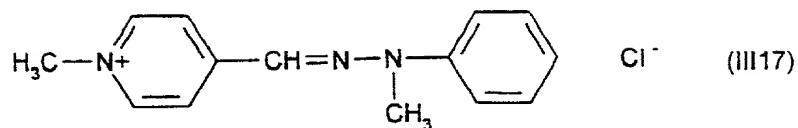
5. Composition according to Claim 1,
5 characterized in that the cationic direct dyes of

formula (III) are chosen from the compounds corresponding to the following structures (III1) to (III18):

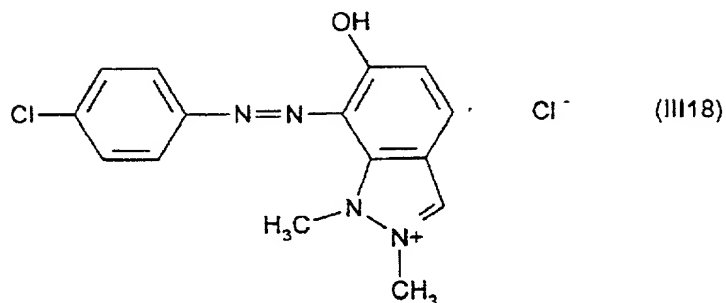






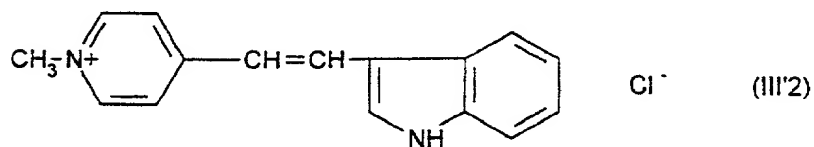
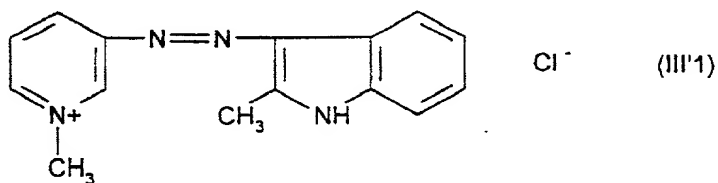


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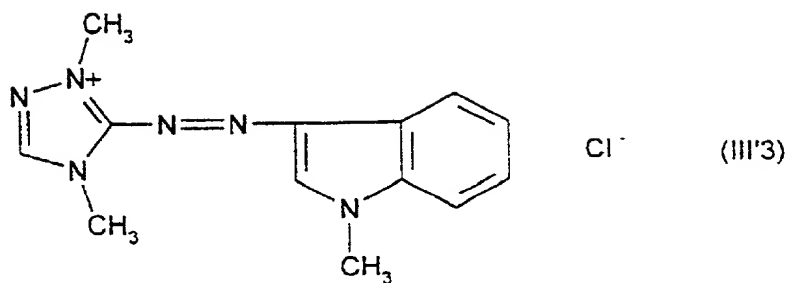


6. Composition according to Claim 5,
 characterized in that the cationic direct dyes of
 formula (III) are chosen from the compounds
 5 corresponding to the structures (III4), (III5) and
 (III13).

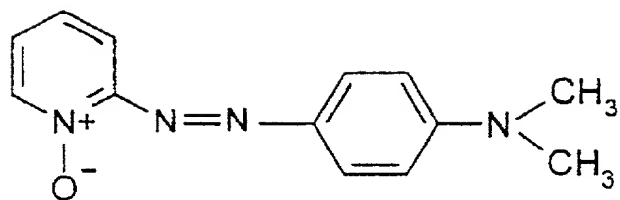
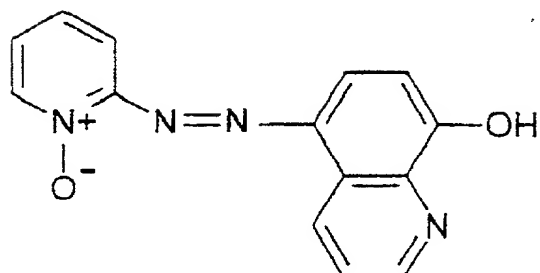
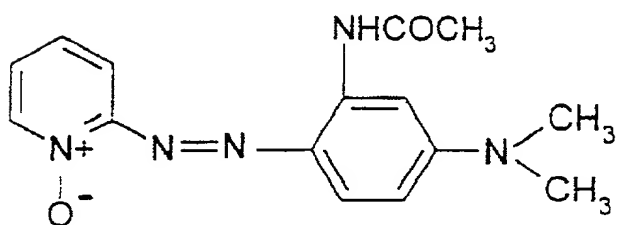
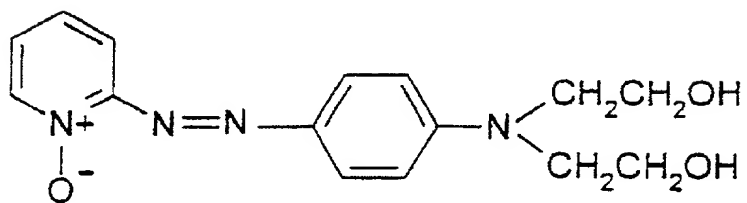
7. Composition according to Claim 1,
 characterized in that the cationic direct dyes of
 formula (III') are chosen from the compounds
 10 corresponding to the following structures (III'1) to
 (III'3):

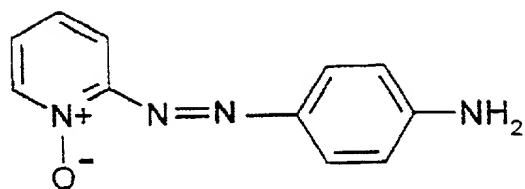
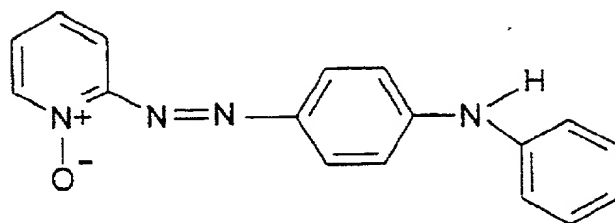
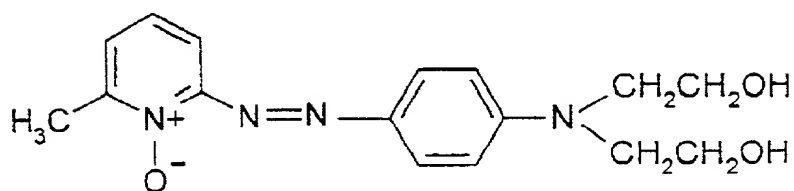
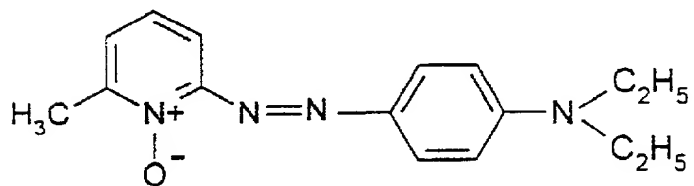
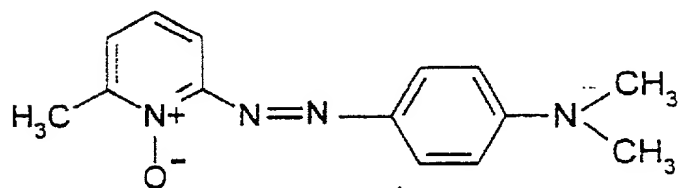
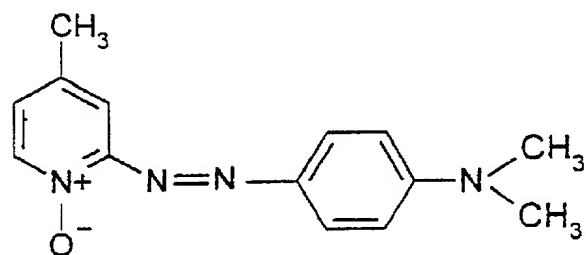


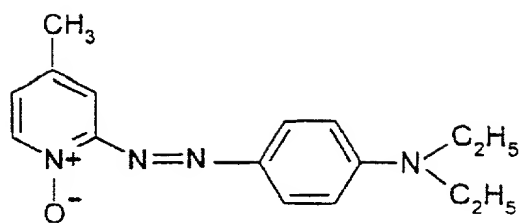
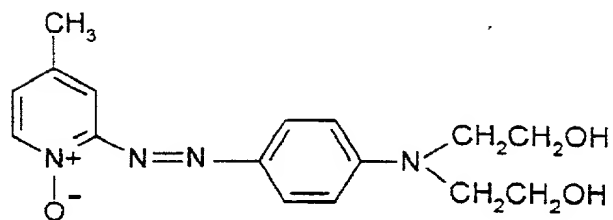
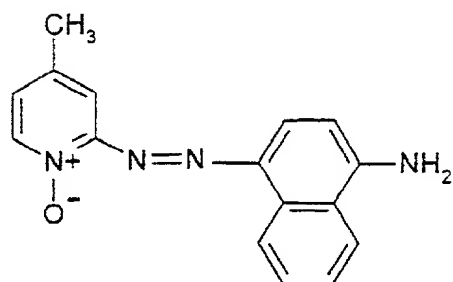
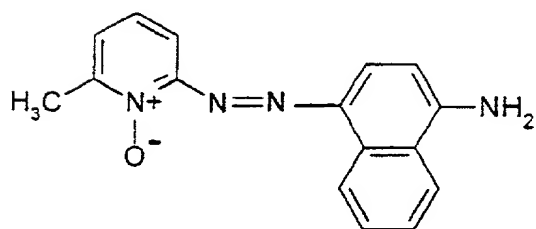
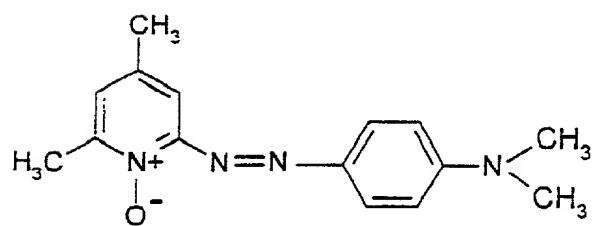
; and

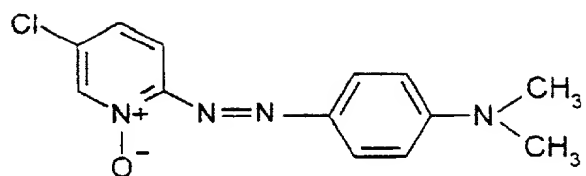
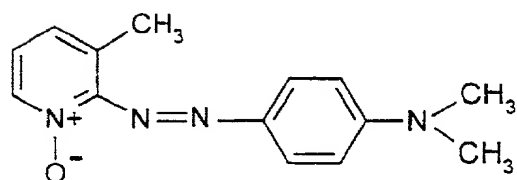
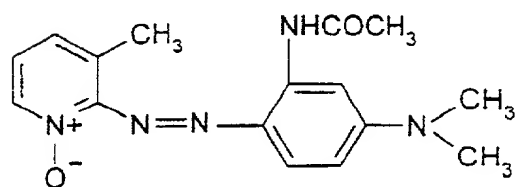
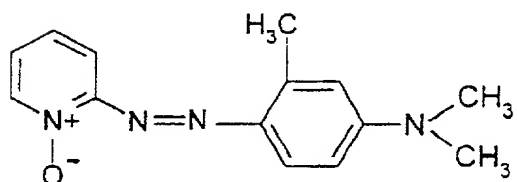
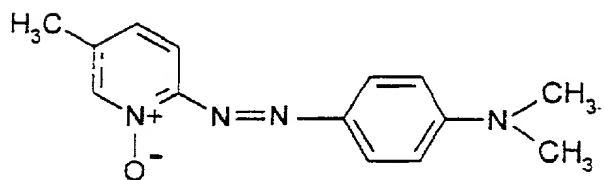
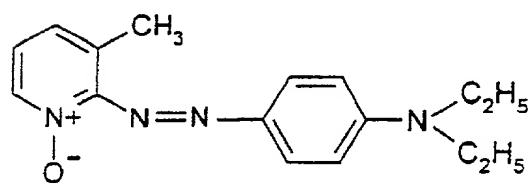


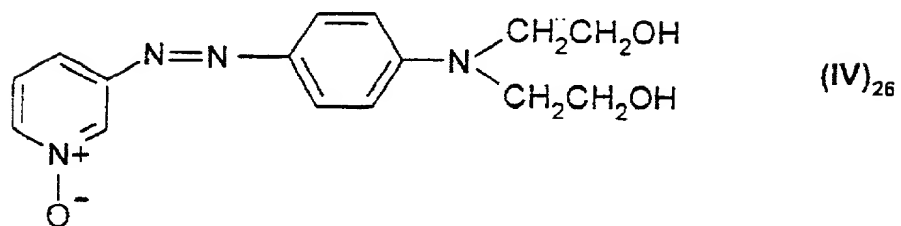
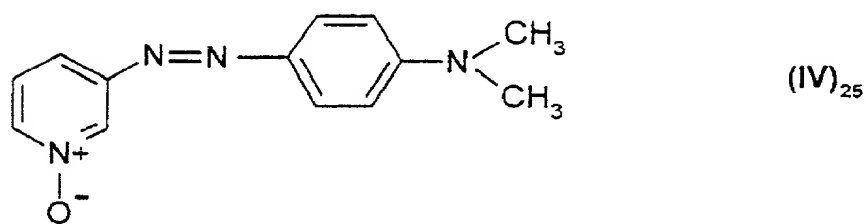
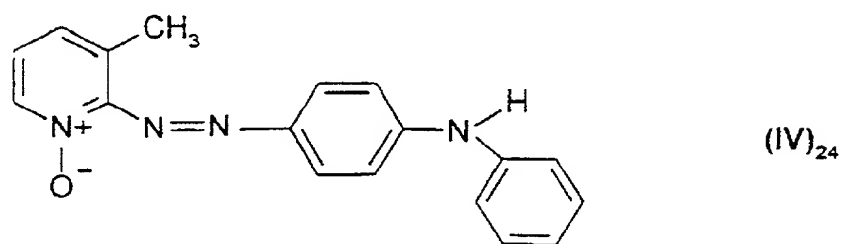
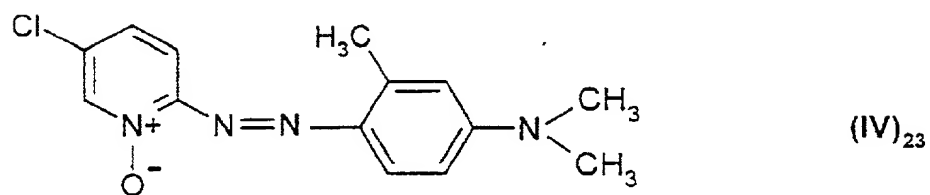
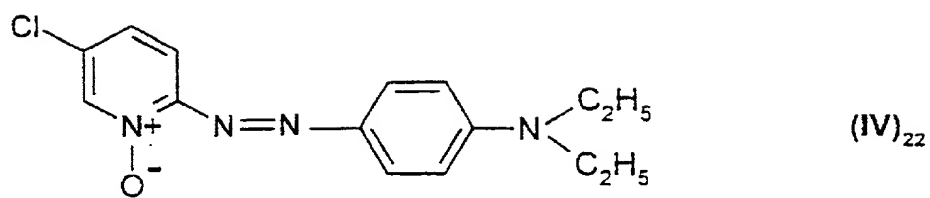
8. Composition according to Claim 1, characterized in that the cationic direct dyes of formula (IV) are chosen from the compounds
- 5 corresponding to the following structures (IV)₁ to (IV)₇₇:

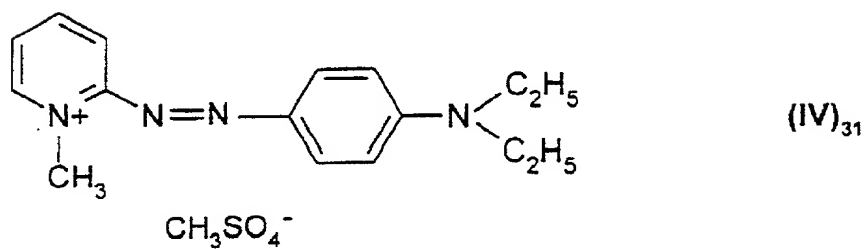
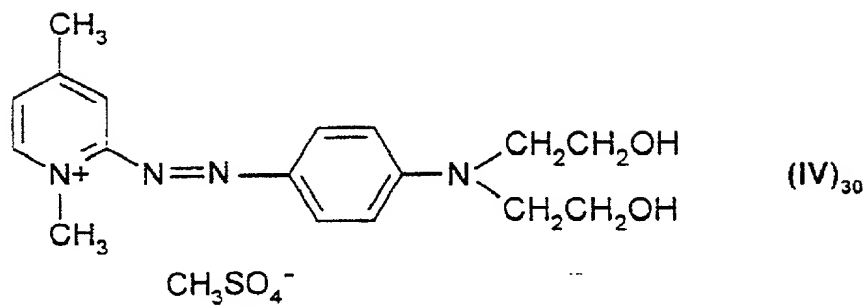
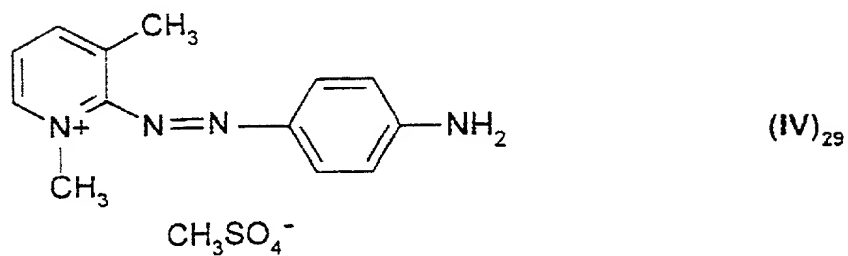
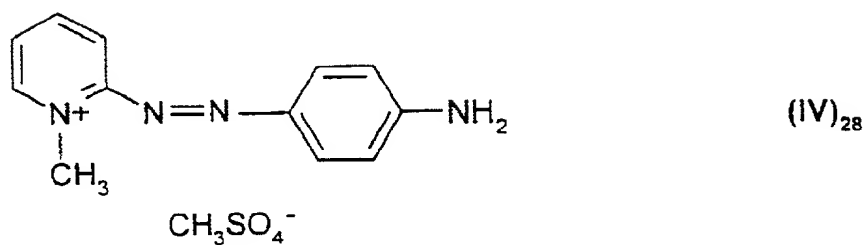
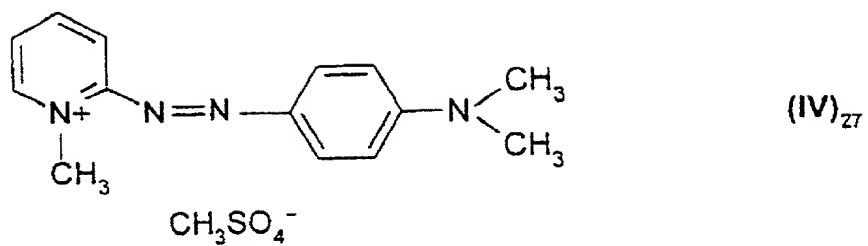
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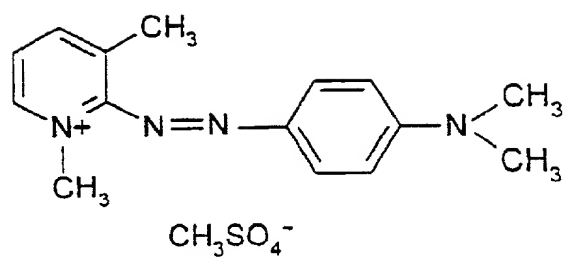
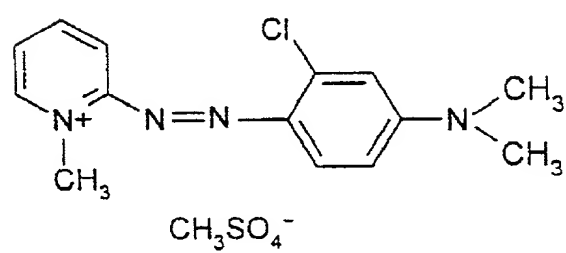
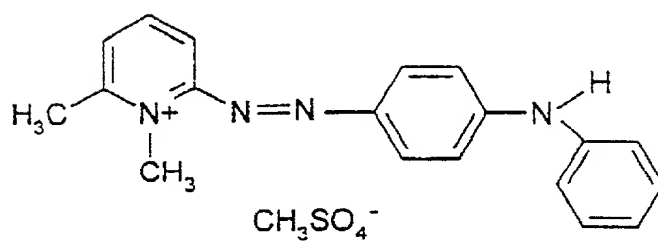
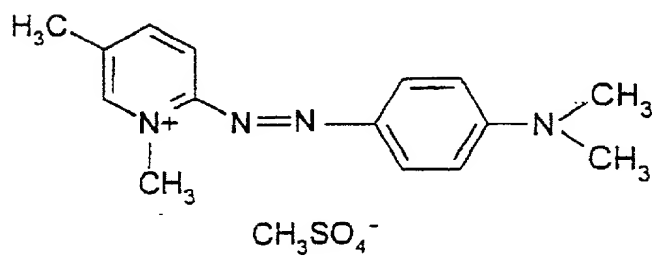
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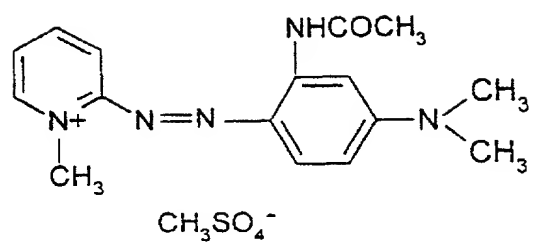
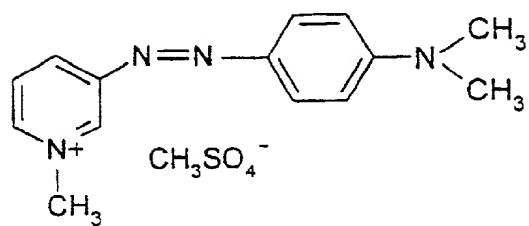
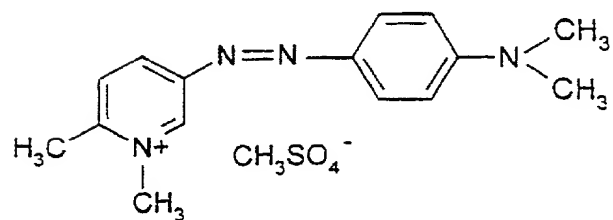
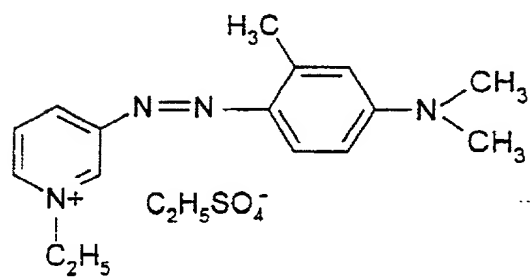
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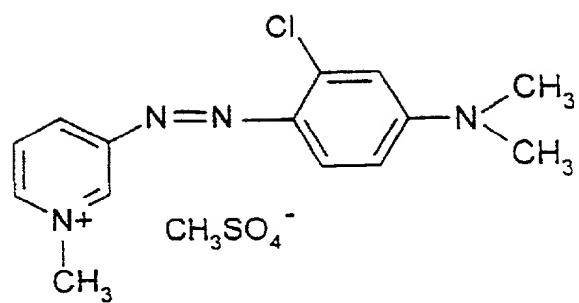
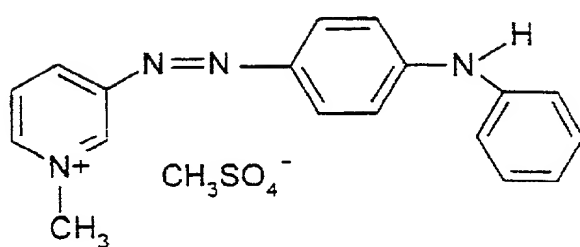
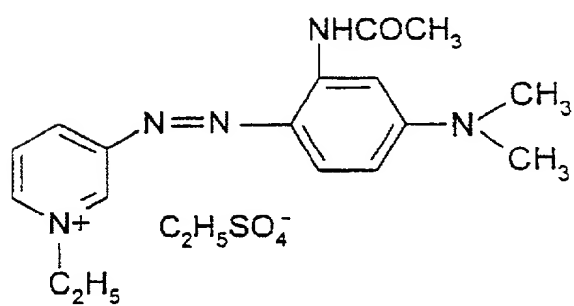
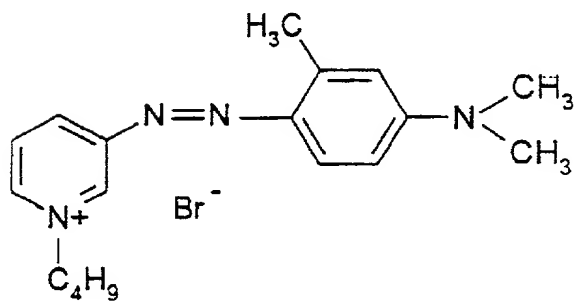
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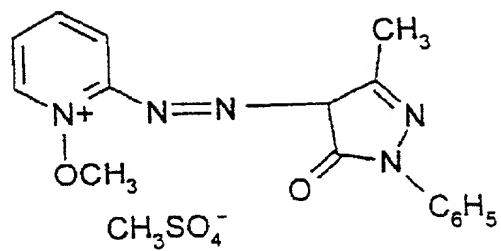
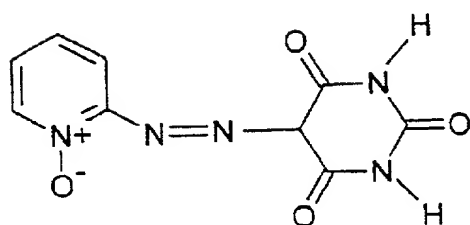
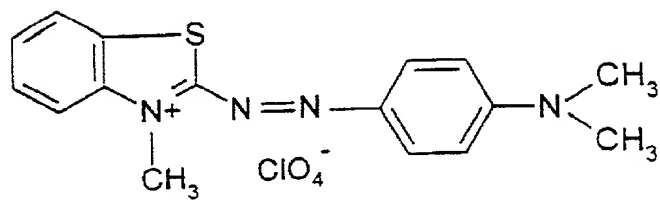
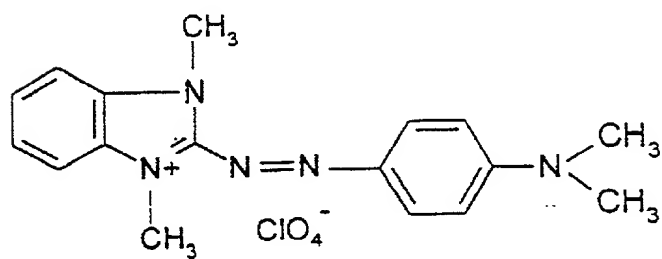
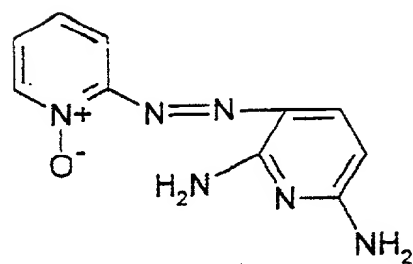


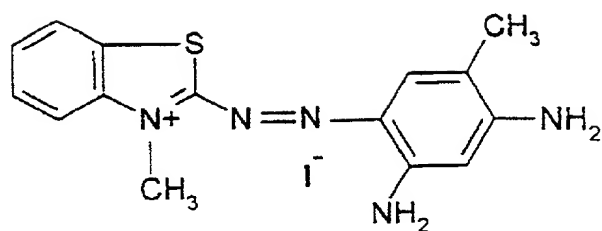
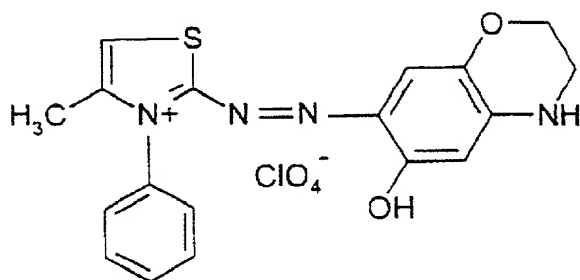
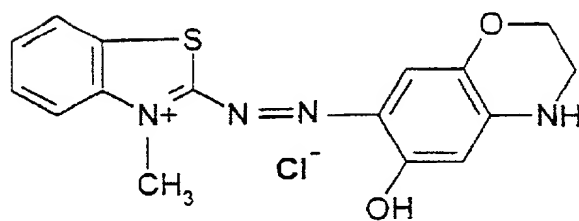
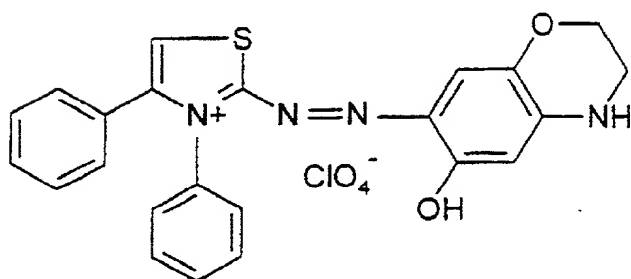


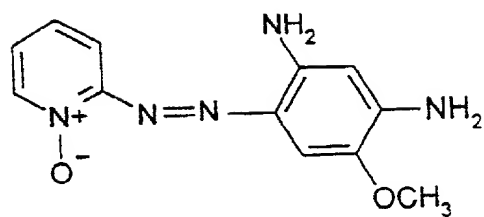
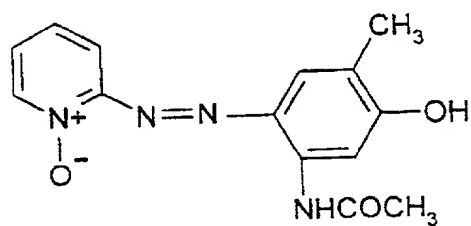
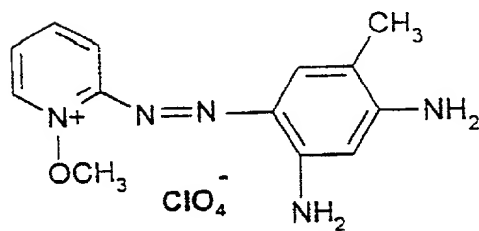
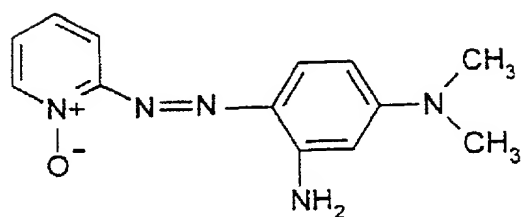
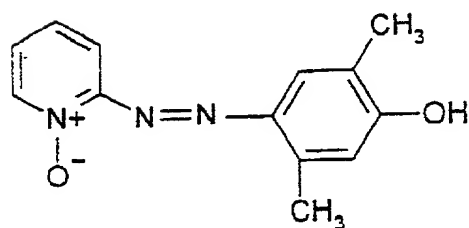
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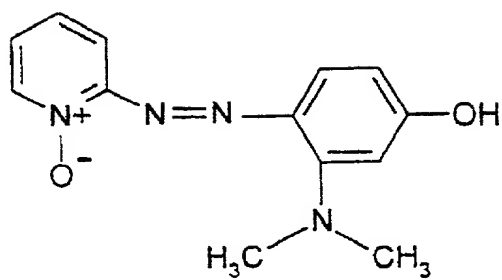
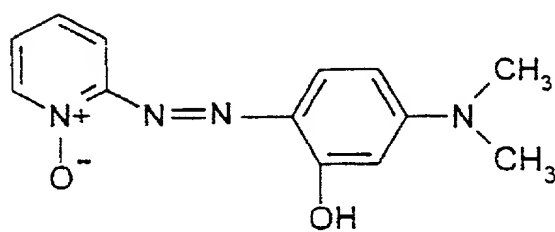
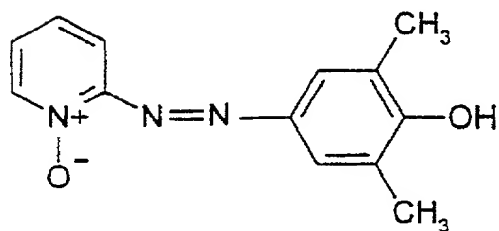
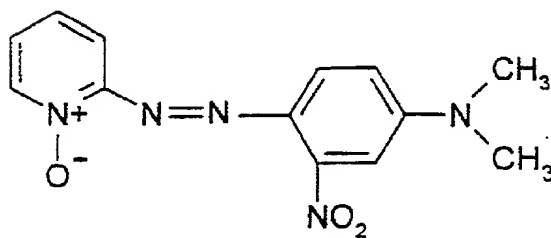
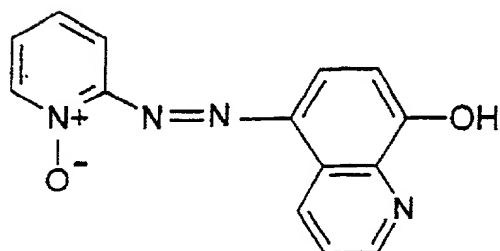
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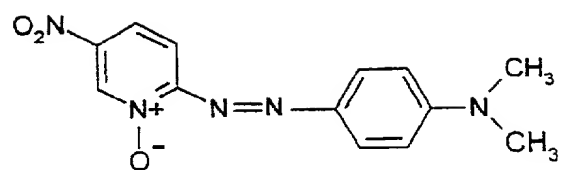
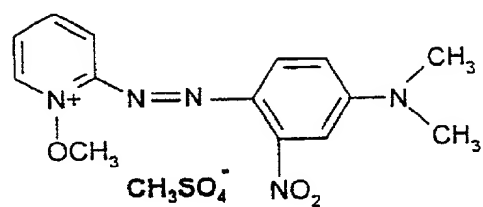
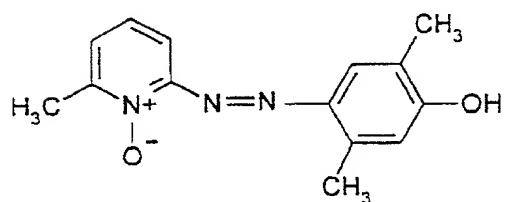
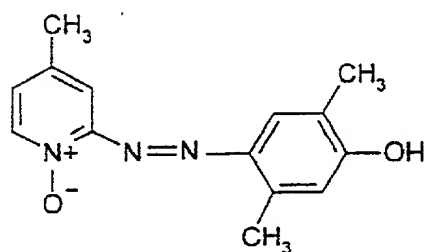
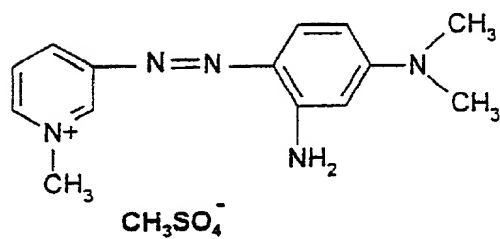
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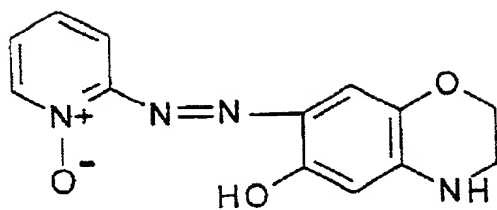
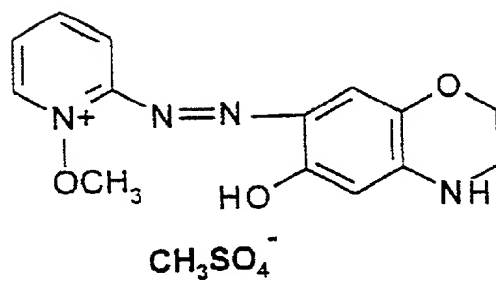
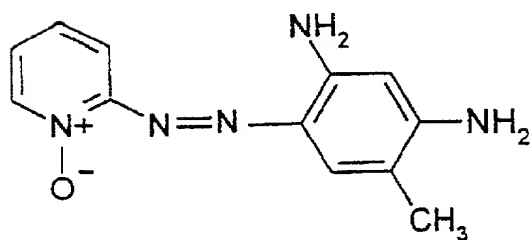
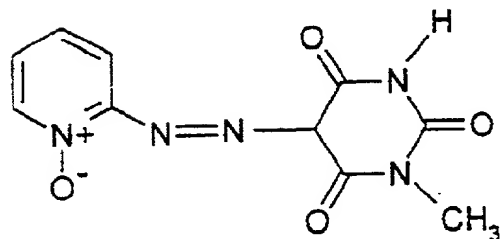
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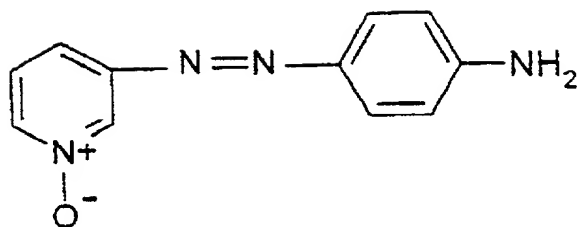
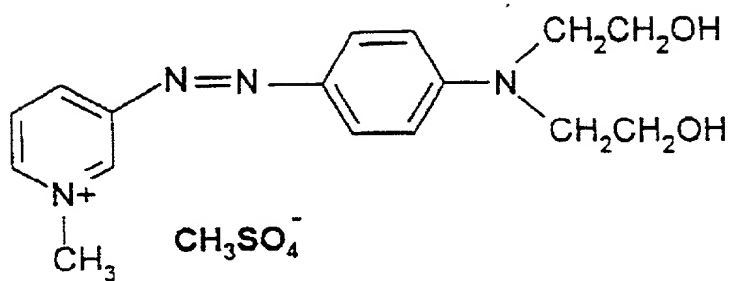
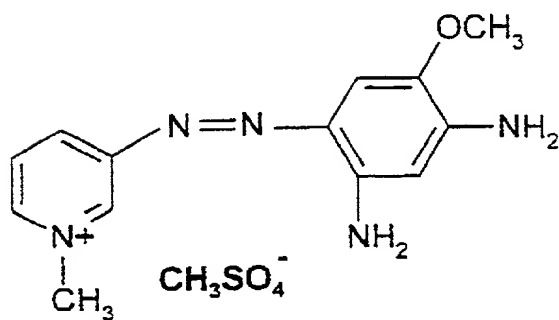
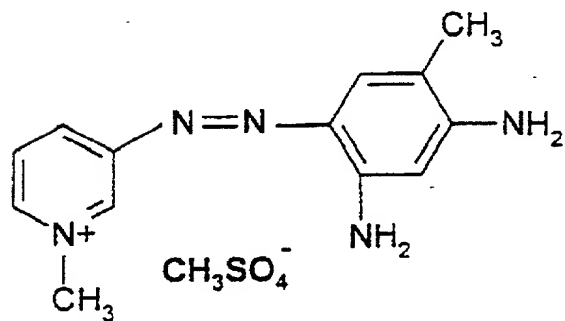
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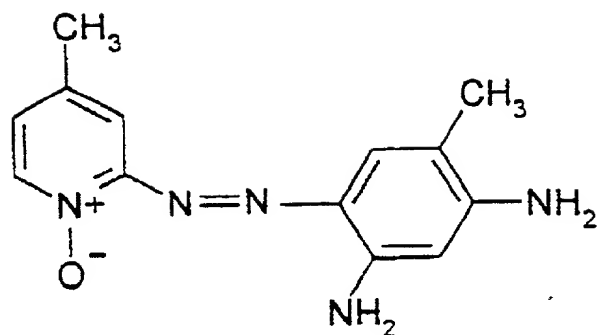
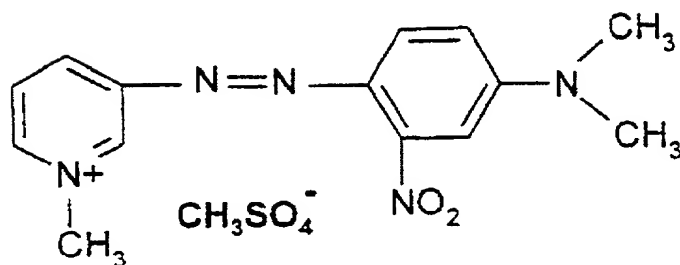
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(IV)₆₃(IV)₆₄(IV)₆₅(IV)₆₆(IV)₆₇

(IV)₆₈(IV)₆₉(IV)₇₀(IV)₇₁

(IV)₇₂(IV)₇₃(IV)₇₄(IV)₇₅

(IV)₇₆(IV)₇₇

9. Composition according to any one of the preceding claims, characterized in that the cationic direct dye(s) of formulae (I), (II), (III), (III') or (IV) represent from 0.001 to 10% by weight of the total weight of the composition.

10. Composition according to Claim 9, characterized in that the cationic direct dye(s) of formulae (I), (II), (III), (III') or (IV) represent from 0.005 to 5% by weight of the total weight of the composition.

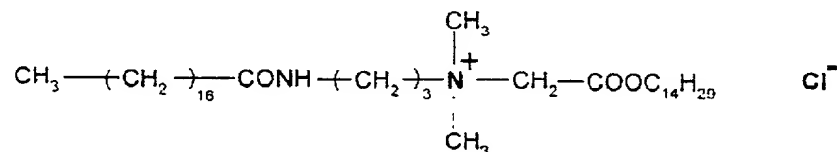
11. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is a dialkyldimethylammonium or alkyltrimethylammonium salt in which the alkyl radical comprises from 12 to 22 carbon atoms.

12. Composition according to Claim 11, characterized in that it is distearyldimethylammonium chloride, cetyltrimethylammonium chloride or behenyltrimethylammonium chloride.

5 13. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is a di(C₁-C₂ alkyl)(C₁₂-C₂₂ alkyl)hydroxy(C₁-C₂ alkyl)ammonium salt.

10 14. Composition according to Claim 13, characterized in that it is oleocetylhydroxyethylammonium chloride.

15 15. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt (ii) of formula (V) is stearamidopropyldimethyl (myristyl acetate) ammonium chloride of formula:



20 16. Composition according to any one of the preceding claims, characterized in that the quaternary ammonium salt(s) (ii) represent from 0.01 to 10% by weight of the total weight of the dyeing composition.

25 17. Composition according to Claim 16, characterized in that the quaternary ammonium salt(s) represent from 0.05 to 5% by weight of the total weight of the dyeing composition.

18. Composition according to any one of the preceding claims, characterized in that the appropriate dyeing medium (or carrier) consists of water or of a mixture of water and of at least one organic solvent.

5 19. Composition according to any one of the preceding claims, characterized in that it has a pH of between 2 and 11, and preferably between 5 and 10.

20. Composition according to any one of the preceding claims, characterized in that it is intended
10 for oxidation dyeing and in that it contains one or more oxidation bases chosen from the para-phenylenediamines, the bis-phenylalkylenediamines, the para-aminophenols, the ortho-aminophenols and the heterocyclic bases.

15 21. Composition according to Claim 20, characterized in that the oxidation base(s) represent 0.0005 to 12% by weight of the total weight of the dyeing composition.

22. Composition according to Claim 21,
20 characterized in that the oxidation base(s) represent 0.005 to 6% by weight of the total weight of the dyeing composition.

23. Composition according to any one of Claims 20 to 22, characterized in that it contains one
25 or more couplers chosen from the the meta-phenylenediamines, the meta-aminophenols, the meta-diphenols and the heterocyclic couplers.

24. Composition according to Claim 23, characterized in that the coupler(s) represent from 0.0001 to 10% by weight of the total weight of the dyeing composition.

5 25. Composition according to Claim 24, characterized in that the coupler(s) represent from 0.005 to 5% by weight of the total weight of the dyeing composition.

10 26. Composition according to any one of the preceding claims, characterized in that it is intended for direct lightening dyeing or oxidation dyeing and in that it then contains at least one oxidizing agent.

15 27. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that at least one dyeing composition as defined in any one of Claims 1 to 26 is applied to the fibres for a sufficient time to develop the desired colour, after which they are rinsed, optionally washed with shampoo, rinsed again and dried.

20 28. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that at least one dyeing composition as defined in any one of Claims 1 to 26 is applied to the fibres for a sufficient time to develop the desired
25 colour, with no final rinsing.

29. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that it comprises a preliminary stage

consisting of storing in a separate form, on the one hand, a composition (A1) comprising, in an appropriate dyeing medium, at least one cationic direct dye (i) as defined in the preceding claims and at least one
5 oxidation base and, on the other hand, a composition (B1) containing, in an appropriate dyeing medium, at least one oxidizing agent, and then mixing them at the time of use before applying this mixture to the keratinous fibres, the composition (A1) or the
10 composition (B1) containing the quaternary ammonium salt (ii) as defined in the preceding claims.

30. Method of dyeing keratinous fibres and in particular human keratinous fibres such as hair, characterized in that it comprises a preliminary stage
15 consisting of storing in a separate form, on the one hand, a composition (A2) comprising, in an appropriate dyeing medium, at least one cationic direct dye (i) as defined in the preceding claims and, on the other hand, a composition (B2) containing, in an appropriate dyeing
20 medium, at least one oxidizing agent, and then mixing them at the time of use before applying this mixture to the keratinous fibres, the composition (A2) or the composition (B2) containing the quaternary ammonium salt (ii) as defined in the preceding claims.

25 31. Multicompartment device or multicompartment dyeing "kit", characterized in that a first compartment contains composition (A1) or (A2) as defined in Claim 29 or 30 and a second compartment

contains composition (B1) or (B2) as defined in Claim 29 or 30.

**COMPOSITION FOR DYEING KERATINOUS FIBRES WITH A
CATIONIC DIRECT DYE AND A QUATERNARY AMMONIUM SALT**

The invention relates to a composition for dyeing keratinous fibres, in particular human keratinous fibres such as hair, comprising, in an appropriate dyeing medium, at least one cationic direct dye of a given formula, and which is characterized in that it contains, in addition, at least one quaternary ammonium salt.

The invention also relates to the dyeing methods and devices using it.

Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoir pour Demand de Brevet

French Language Declaration

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

DYEING COMPOSITION FOR KERATINOUS FIBRES
WITH DIRECT CATIONIC COLOURING AGENT AND A
QUATERNARY AMMONIUM SALT

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

the specification of which is attached hereto unless the following box is checked:

☒ a été déposée le _____
sous le numéro de demande des Etats-Unis ou le
numéro de demande international PCT
_____ et modifiée
_____ (les cas échéant).

☒ was filed on July 28, 1999 as United States
Application Number or PCT International
Application Number PCT/FR99/01865 and was
amended on _____ (if applicable).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

Prior foreign application(s)
Demande(s) de brevet antérieure(s)

98/10547	France
(Number)	(Country)
(Numéro)	(Pays)
<hr/>	
(Number)	(Country)
(Numéro)	(Pays)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)
<hr/>	
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont laquelle est devenue disponible entre la date de dépôt de la demande antérieure, et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)
<hr/>	
(Application No.)	(Filing Date)
(N° de demande)	(Date de dépôt)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International Application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Priority Not Claimed
Droit de priorité non revendiqué

19 August 1998	<input type="checkbox"/>
(Day/Month/Year Filed)	
(Jour/Mois/Année de dépôt)	
<hr/>	
(Day/Month/Year Filed)	<input type="checkbox"/>
(Jour/Mois/Année de dépôt)	

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International Application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose any or all information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Status) (patented, pending, abandoned)	
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(Status) (patented, pending, abandoned)	
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec L'Office des brevets et des marques: (mentionner le nom et le numéro d'enregistrement).

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this patent application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number):

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P., Reg. No. 22,540; Douglas B. Henderson, Reg. No. 20,291; Ford F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvold, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Hefter, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zotter, Reg. No. 27,680; Dennis P. O'Reilley, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,695; Robert D. Bajefsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; Basil J. Lewis, Reg. No. 28,818; Martin I. Fuchs, Reg. No. 28,508; E. Robert Yoches, Reg. No. 30,120; Barry W. Graham, Reg. No. 29,924; Susan Haberman Griffen, Reg. No. 30,907; Richard B. Racine, Reg. No. 30,415; Thomas H. Jenkins, Reg. No. 30,857; Robert E. Converse, Jr., Reg. No. 27,432; Clair X. Mullen, Jr., Reg. No. 20,348; Christopher P. Foley, Reg. No. 31,354; John C. Paul, Reg. No. 30,413; Roger D. Taylor, Reg. No. 28,992; David M. Kelly, Reg. No. 30,953; Kenneth J. Meyers, Reg. No. 25,146; Carol P. Einaudi, Reg. No. 32,220; Walter Y. Boyd, Jr., Reg. No. 31,738; Steven M. Anzalone, Reg. No. 32,095; Jean B. Fordis, Reg. No. 32,984; Barbara C. McCurdy, Reg. No. 32,120; James K. Hammond, Reg. No. 31,964; Richard V. Burgujian, Reg. No. 31,744; J. Michael Jakes, Reg. No. 32,824; Dirk D. Thomas, Reg. No. 32,600; Thomas W. Banks, Reg. No. 32,719; Christopher P. Isaac, Reg. No. 32,616; Bryan C. Diner, Reg. No. 32,409; M. Paul Barker, Reg. No. 32,013; Andrew Chanho Sonu, Reg. No. 33,457; David S. Forman, Reg. No. 33,694; Vincent P. Kovalick, Reg. No. 32,867; James W. Edmondson, Reg. No. 33,871; Michael R. McGurk, Reg. No. 32,045; Joann M. Neith, Reg. No. 36,363; Gerson S. Panitch, Reg. No. 33,751; Cheri M. Taylor, Reg. No. 33,216; Charles E. Van Horn, Reg. No. 40,266; Linda A. Wadler, Reg. No. 33,218; Jeffrey A. Berkowitz, Reg. No. 36,743; Michael R. Kelly, Reg. No. 33,921; and James B. Monroe, Reg. No. 33,971; **and** Thalia V. Warnement, Reg. No. 39,064; Michele C. Bosch, Reg. No. 40,524; Allen R. Jensen, Reg. No. 28,224; Mark D. Sweet, Reg. No. 41,469; and Anthony M. Gutowski, Reg. No. 38,742.

Addresser toute correspondance à:

Send all Correspondence to:

L.L.P.

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER,

1300 I Street, N.W., Washington, D.C. 20005,
Telephone No. (202) 408-4000.

Addresser tout appel téléphonique à:
(nom et numéro de téléphone)

Direct all Telephone Calls to:
(name and telephone number)

Thomas L. Irving, Reg. No. 28,619
Telephone Number (202) 408-4082

Nom complet de l'unique ou premier inventeur: 1-00		Full name of sole or first inventor Christine RONDEAU	
Signature de l'inventeur Rondeau Christine	Date 10/04/2000	Inventor's signature Rondeau Christine	Date 10/04/2000
Domicile		Residence 10 bis, rue de Verdun, F-78500 Sartrouville, France FRX	
Nationalité:		Citizenship French	
Adresse postale:		Post Office Address Same as residence	
Nom complet du second co-inventeur, le cas échéant:		Full name of second joint inventor, if any:	
Signature du second inventeur	Date	Second Inventor's signature	Date
Domicile:		Residence	
Nationalité:		Citizenship	
Adresse postale:		Post Office Address	
Nom complet du third co-inventeur, le cas échéant:		Full name of third joint inventor, if any:	
Signature d'inventeur	Date	Third Inventor's signature	Date
Domicile		Residence	
Nationalité:		Citizenship	
Adresse postale:		Post Office Address	